

## Additions to the Orchid Flora of Central America with Observations on Noteworthy Species

BY

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IN this paper I have proposed one new genus and forty new species. These represent for the most part Costa Rican orchids sent for identification by Captain Arthur W. Hill, Director of the Royal Gardens, Kew, and by C. H. Lankester. Several species from Panama which appear to be new are included, these having been detected in recent collections made by C. W. Powell near Panama City. I have also included several species which demand attention at this time because they have remained obscure since the date of publication or have been misunderstood in recent work on the orchids of Central America. For the opportunity to illustrate and amplify the original descriptions of *Epidendrum gravidum* Lindl. and *E. trachycarpum* Lindl., two Mexican orchids which have been extremely perplexing because insufficiently characterized when proposed, I am indebted to the Director of Kew, who supplied flowers from the type specimens. The vegetative parts of *E. trachycarpum* and the raceme of *E. gravidum* were drawn with the aid of the camera-lucida from photographs preserved in my herbarium, these photographs having been taken from the type specimens. The type specimen of *E. gravidum* consists only of a raceme. Lindley did not have the pseudobulbs and leaves of this species.

## CENTRAL AMERICAN ORCHIDS

The colors in Mr. Lankester's field-notes are those given in Ridgway's "Color Standards and Color Nomenclature."

The descriptions are from herbarium specimens.

The arrangement of genera and species follows Pfitzer's system proposed in Engler and Prantl's "Die natürlichen Pflanzenfamilien."

**Habenaria Lankesteri** Ames sp. nov. Herba ter-  
restris. Caules prope basim foliosi. Bracteae supra folia  
vaginantes. Flores virides, in racemum subdensum dis-  
positi. Sepala lateralibus deflexa, ovato-oblonga, concava.  
Sepalum dorsale erectum, late ovatum, valde concavum.  
Petala oblongo-triangularia, antice prope basim in dentem  
abbreviatum producta. Labellum tripartitum, divisionibus  
subaequalibus, linear-oblongis. Calcar dependens, ovarium  
subaequans.

Terrestrial herb 12-18 cm. tall. Leaves approximate,  
more or less basal, 4-5 cm. long, about 7 mm. wide, nar-  
rowly elliptic-oblong, tapering gradually toward both ends,  
acute, obliquely ascending, two of the leaves well developed,  
passing gradually into the acuminate bracts that sheath the  
upper part of the stem. Bracts of the stem two, alternate,  
closely appressed, 1.5-2.3 cm. long. Raceme 3-4 cm. long,  
five or more flowered. Bracts of the raceme about 1 cm.  
long, closely appressed to the ovary, lanceolate, acuminate.  
Pedicels very short, the ovary nearly sessile. Flowers green  
when alive, becoming brownish when dry. Lateral sepals  
slightly exceeding 4 mm. in length, about 2 mm. wide,  
pendent, ovate-oblong, strongly concave, fleshy, obtuse,  
somewhat thickened at the tip. Dorsal sepal 4 mm. long,  
elliptic-ovate, strongly concave, erect, the margin over-  
lapping the petals. Petals 3.5 mm. long, about 1.5 mm.  
wide, triangular-oblong, subacute, fleshy, with a short  
obliquely ascending tooth at the base on the anterior  
margin. Labellum fleshy, tripartite, the divisions subequal  
and linear-oblong, the laterals slightly shorter than the  
middle one, from base of labellum to tip of middle division

4 mm. long; lateral divisions subparallel to the middle one, 3 mm. long, hardly 1 mm. wide; middle division slightly exceeding 3 mm. in length, twice broader than the lateral divisions. Spur pendent, about 1 cm. long, slender. Stigmatic process prominent.

Allied to *Habenaria repens* Nutt., but differs in the structure of the labellum and petals.

COSTA RICA, Jocosal, C. H. Lankester 342, December 16, 1919. (TYPE in Herb. Kew.)

**Lankesterella** Ames gen. nov. Sepalum dorsale erectum, liberum. Sepala lateralialia cum columnae basi cohaerentia, mentum distinctum formantia. Petala angustata, libera. Labellum basi columnae affixum, exungiculatum; lamina erecta basi subsaccata e sepalis lateralibus tamen non protrudens, intus glabra, plus minusve pandurata. Columna brevis, prope medium valde curvata, transverse complanata in pedem semiliberum producta. Rostellum nonevolutum vel valde membranaceum. Anthera sagittata, erecta, longe stipitata, apicem columnae excedens. Pollinia pulvereo-granulosa. Capsula ovoidea. Herba epiphytica, glandulosa. Folia radicalia plura, vix petiolata, membranacea, caulina nulla. Flores mediocres in racemo laxo. Bracteae inflorescentiae membranaceae, magnae.

Dorsal sepal erect, free from the petals, inserted just below the point of origin of the anther. Lateral sepals erect, hardly spreading, coherent at the base, united with the lower half of the column forming a distinct rounded mentum which includes and conceals the base of the labellum. Petals parallel to the dorsal sepal, inserted on the column, erect. Labellum affixed to the foot of the column, erect, sessile, strongly concave or subsaccate, continued upward into a panduriform lamina, provided below the middle on each side with a margined appendage. Column transversely flattened, curved sharply backward from about the middle, continued obliquely downward on the summit of the ovary into a distinct foot. Rostellum abbreviated. Anther inserted near the base of the erect portion of the column, stipitate, sagittate. Pollinia granulose. Capsule

ovoid, glandular-pubescent. Epiphytic herb with radical, sessile, membranaceous leaves. Scape densely long-hairy. Flowers ascending or erect in loose few-flowered racemes. Bracts of the inflorescence ample.

*Lankesterella* is a member of the *Spiranthinae*, distinguished in part from its allies by the free petals, and transversely complanate curved column which is produced into a foot. There is not any rostellar projection as in *Spiranthes* and its allies. In habit suggesting those species of *Stenorrhynchus* which Schlechter transferred to *Cladobium*.

***Lankesterella costaricensis* Ames sp. nov.** Radices carnosae, albidae, villosae, patentes. Folia rosulata, membranacea, sessilia, margine ciliata, elliptica, acuta. Scapus longe glanduloso-pubescent, infra racemum ebracteatus. Racemus plus minusve quinqueflorus, laxi-vel densiflorus. Rachis flexuosa. Bractee inflorescentiae flores juveniles aequantes, ovatae, longe glandulosae. Pedicellus cum ovario dense et longe glandulosus, demum bracteas excedens. Flores plus minusve inter se distantes. Sepala lateraliam mentum obtusum formantia, supra basim libera, longe triangularia, acuta, extus dense glanduloso-villosa. Sepalum dorsale liberum, oblongum, subobtusum, concavum, extus dense glanduloso-villosum. Petala oblonga, usque ad apicem angustata, apice villifera, trinervia. Labellum elongatum, basi saccatum vel valde concavum; lamina supra saccum pandurata, margine utrinque prope basim labelli breviter appendiculata. Columna in pedem producta, supra medium transverse complanata, recurvata. Anthera sagittata.

Roots coarse, whitish, villose. Stems abbreviated. Leaves rosulate spreading, petiolate, 1-2.5 cm. long, up to 1 cm. wide, narrowly elliptic, acute, narrowed toward the base, ciliate on the margin, membranaceous, reddish brown when dry. Scape with the raceme 5-10 cm. long, densely glandular-villose. Raceme 3-7 cm. long, three to ten or more flowered. Rachis flexuose, densely glandular-villose. Bracts of the raceme 5-15 mm. long, ovate, acuminate,



## CENTRAL AMERICAN ORCHIDS

villose, clasping the base of the ovary. Flowers 5–10 mm. apart. Ovary densely glandular-villose, sessile. Lateral sepals about 7 mm. long, oblong-triangular, acute, forming a blunt mentum, densely glandular-villose on the external surface. Dorsal sepal 6 mm. long, 2 mm. wide, oblong, densely glandular-villose on the exterior surface, free from the petals. Petals 6 mm. long, about 1 mm. wide, oblong, obtuse, with several apical villi, 3-nerved. Labellum 8 mm. long, elongate-panduriform from a strongly concave or subsaccate base, obtuse, glandular on the inner surface above the middle, apical margin involute; there is a thickened dentate callus — one on each side — situated on the margin near the base of the labellum. Column sigmoid, transversely complanate, produced obliquely downward on the summit of the ovary into a distinct foot, free portion of the column 2 mm. long, the foot 2 mm. long. Rostellum not at all produced. Anther inserted near the base of the free portion of the column, sagittate, long-stipitate. Pollinia granulose.

In habit not unlike *Stenorrhynchus ceracifolius* Rodr. (*Gladobium ceracifolium* Schltr.), but with more flowers in the raceme and a very different column.

COSTA RICA, La Estrella, C. H. Lankester & Alfredo Sancho 387, January 9, 1923. Roadside on polled fence-tree. Spikes pendent. (TYPE in Herb. Ames No. 23725.)

***Cranichis Lankesteri* Ames sp. nov.** Radices fibratae, elongatae, albido-villosae. Folia longipetiolata, basilaria; lamina foliorum late ovata, acuminata, basi rotundata in petiolum abrupte contracta. Scapus elongatus folia multo excedens, supra albido-villosus, gracilis, paucibracteatus. Racemus subdensiflorus. Bracteae inflorescentiae anguste lanceolatae, acutae, sparse et breviter villosae. Pedicellus gracilis, sparse glandulosus, oblique ascendens. Sepala lateralialia elliptico-ovata, acuta, patentia, trinervia, extus glandulosa. Sepalum dorsale simile. Petala oblonga, obtusa, margine superiore longe ciliata. Labellum unguiculatum, obtuse hastatum, apice longe ciliatum. Columna generis.

Roots elongated, fibrous, villose, the hairs white in dried specimens. Leaves basal, few. Petioles slender, 3-4 cm. long; lamina of the leaf 7-8.5 cm. long, 4 cm. or more wide, membranaceous, broadly ovate from a rounded base, acuminate, acute. Scape with the raceme about 22 cm. long, hairy above. Bracts of the inflorescence greenish, narrowly lanceolate, 4-7 mm. long, sparsely pubescent. Raceme nearly 4 cm. long, about 1.5 cm. in diameter. Pedicels about 1 cm. long, sparsely glandular. Flowers resupinate. Lateral sepals 5.5 mm. long, 3 mm. wide, elliptic-ovate, acute, glandular on the exterior surface, 3-nerved. Dorsal sepal 5.5 mm. long, similar to the laterals. Petals 4.5 mm. long, 2 mm. wide, inserted on the base of the column, oblong, rounded at the tip, obtuse, upper margin long-ciliate. Labellum 5 mm. long, unguiculate, about 4 mm. wide in front of the claw when spread out, hastate, rounded at the tip, long-ciliate on the margin of the apical third. Column 2.5 mm. long, fleshy, truncate at the summit. Anther elliptical, fleshy. Pollinia elongated, slenderly pyriform, attached to a round thickened disc.

I have referred this species to *Cranichis* although in the structure of the unguiculate labellum it is dissimilar to the characteristic species of the genus. There are no near allies in the Central American orchid flora.

COSTA RICA, Cachi, C. H. Lankester 81, October 22, 1916. Leaves satin-surfaced, dusky olive-green (Ridgway), darkest in the region of the veins. Rachis ochre-red (Ridgway); bracts light cr  ss-green, obverse sepals testaceous. Lower edge of petals ciliate, these with the whole flower pure white, except two side lobes of lip orange-yellow, end of lip ciliate with a testaceous spot inside. (TYPE in Herb. Kew.)

***Cranichis saccata* Ames sp. nov.** Herba terrestris. Folia basilaria, breviter petiolata, ovato-elliptica. Scapus erectus, paucibracteatus, supra medium glandulosus. Racemus sublaxus. Sepala lateralia basi protuberantia, supra insertionem triangularia, extus glandulosa. Sepalum dorsale anguste ellipticum, acutum, uninervium, sparse glandulosum. Petala membranacea, elliptico-oblonga, apice

## CENTRAL AMERICAN ORCHIDS

rotundata, conspicue uninervia, margine sparse ciliolata. Labellum basi profunde saccatum, antice in laminam conduplicatam extensum. Columna generis.

Terrestrial herb about 20 cm. tall, with nine or more leaves clustered at the base. Leaves petiolate, spreading; petioles up to 1.5 cm. or more long, sheathing the stem at base; lamina of the leaf membranaceous, 1.5–2.5 cm. long, up to 1.5 cm. wide, the smaller ones nearest the base of the stem. Scape with few bracts, glandular-pubescent above the middle, lowermost bract foliaceous, upper ones more or less closely appressed, 1–2 cm. long, acute, glabrous. Raceme ten or more flowered, exceeding 3.5 cm. in length; rachis glandular-pubescent. Bracts of the raceme oblong-lanceolate, not exceeding the ovary in length. Pedicellate ovary about 7 mm. long, densely glandular. Lateral sepals 4 mm. long from the point of insertion at the base of the column to their tip, with a conspicuous rounded posterior protuberance which is 2 mm. long, triangular-acute above the middle, sparsely glandular-pubescent on the outer surface. Dorsal sepal 5 mm. long, 2 mm. wide near the middle, narrowly elliptical, obtuse, mid-nerve conspicuous. Petals about 4 mm. long, 1.5 mm. wide, elliptic-oblong, rounded-obtuse at the apex, median nerve conspicuous, lower margin obscurely ciliolate. Labellum 6 mm. long, deeply saccate, with the sac subcylindrical and blunt; lamina above the sac porrect, more or less conduplicate, obtusely truncate, 4 mm. long, hardly 2 mm. wide when spread out, with a prominent erect callus at the base in front of the opening of the sac; basal margin of the labellum obscurely crenate-dentate. Column 3 mm. long.

In the structure of the labellum *Cranichis saccata* differs from all other species in the Central American area. The protuberant basal portion of the lateral sepals is anomalous in the genus.

COSTA RICA, Cascajal, C. H. Lankester K351. In pastures. 5500 feet altitude. (TYPE in Herb. Kew.)

**Malaxis Lankesteri** Ames sp. nov. Herba terrestris, bifoliata, foliis prope medium plantae. Radices fibratae.

## CENTRAL AMERICAN ORCHIDS

Caulis elongatus, gracilis. Folia approximata, subelliptica, in sicco valde membranacea, obtusa. Racemus congestus, flores subumbellati. Bracteae inflorescentiae squamiformes, acutae. Pedicelli graciles, oblique ascendentes. Sepala lineari-oblonga, margine valde revoluta. Petala filiformia. Labellum valde concavum, vix auriculatum, apice obscure trilobatum; lobis lateralibus porrectis, obtusis; lobo medio producto, obtuso, lateralibus angustiori. Discus in medio carinatus. Columna brevis.

Terrestrial herb up to 28 cm. high, bifoliate near the middle. Leaves approximate, 5.5 cm. long, 3 cm. wide, subelliptical, obtuse, membranaceous, mid-nerve prominent beneath. Peduncle, — or stem, — above the leaves, 18 cm. long, very slender, longitudinally sulcate. Inflorescence subumbellate. Bracts of the inflorescence squamiform, about 1 mm. long, acute, greenish, concave, much shorter than the slender pedicels. Flowers crowded. Pedicels obliquely ascending, with the ovary 5–12 mm. long, smooth, forming an obconical cluster. Lateral sepals nearly 4 mm. long, linear-oblong, obtuse, with the margin strongly revolute. Dorsal sepal similar. Petals filiform, 3.5 mm. long, obtuse. Labellum subsimple, 3 mm. long, without distinct basal auricles, about 2 mm. wide when flattened out, strongly concave, with a raised median carina within, obscurely 3-lobed at the tip; lateral lobes rounded and porrect; middle lobe narrower than the laterals and directed forward. Column short, hardly 1 mm. long.

This is a close ally of *Malaxis lagotis* (Reichb. f.) Ktze., *M. brachyrrhyncha* (Reichb. f.) Ames and *M. Javesiae* (Reichb. f.) Ames. From *M. lagotis* it is at once separable by the single carina of the labellum. *M. brachyrrhyncha* has broad sepals and a different labellum. *M. Javesiae* is monophyllous with quite a different labellum.

COSTA RICA, Las Cóncevas, C. H. Lankester 350, July 1919. (TYPE in Herb. Kew.)

**Cryptophoranthus Powellii** Ames *sp. nov.* Herba epiphytica, pusilla. Caules secundarii plus minusve clongati, vaginis tubulatis ciliatis purpureo-maculatis arcte ap-



# CENTRAL AMERICAN ORCHIDS

pressis obtekti, monophylli. Folium bene marginatum, margine minute ciliatum, anguste ellipticum, utrinque attenuatum, nervo medio subtus minute ciliatum. Flores atrosanguinei. Sepala in basi cohaerentia. Sepala lateraliam lamina valde concavam formantia, extus glandulosa, usque ad apicem obtusum cohaerentia. Sepalum dorsale multo angustius, valde concavum, glandulosum, triangulari-lanceolatum. Petala subspathulata, acuta, binervia, labello multo longiora. Labellum unguiculatum, subsagittatum, subacutum, bilamellatum, lamellis convergentibus. Unguis utrinque lobulis prope basim. Columna valde incrassata.

Secondary stems densely caespitose, 1-2.5 cm. long, when young concealed by tubular purple-spotted hispidulous sheaths, monophyllous. Leaves 2.5-4 cm. long, about 7 mm. wide at the middle, tapering at both ends, narrowly elliptic, marginate, the margins and median nerve distinctly and closely ciliate. Pedicel short, concealed by an ample sheath which is closed in front for half of its length. Ovary 4 mm. long, glandular-pubescent. Flowers atrosanguineous, about 1 cm. long. Lateral sepals coherent at base with the upper sepal, forming a strongly concave glandular-pubescent lamina which is broadly elliptical when spread out. Dorsal sepal 8.5 mm. long, linear-triangular, densely glandular-pubescent. Petals 6 mm. long, about 2 mm. wide above the middle, subspatulate, 2-nerved, glandular-pubescent on the upper half, acute. Labellum 2.5 mm. long, 1 mm. wide near the middle, distinctly unguiculate with a minute lobule on each side at the base of the claw, subsagittate in front of the claw, subacute at the apex, bilamellate, with the lamellae converging. Column about 1.5 mm. long, very stout.

PANAMA, Foothills east of Panama, C. W. Powell 278. Grows in shady places. Leaves dark velvety green, lying flat on the limbs of trees. Flowers in February. Sea level. (TYPE in Herb. Ames No. 23160.)

**Masdevallia panamensis** (Schltr.) Ames comb. nov.

Scaphosepalum panamense Schltr. in Fedde Repert. 12 (1913) 205. Masdevallia Livingstoneana Schltr. in Fedde Repert. Beihefte 17 (1922) 15, non Roczl & Reichb. f.

The type of this species was collected by H. Pittier in the Canal Zone in 1911. Dr. Schlechter placed it in the genus *Scaphosepalum*, but on what characters I do not know, as the floral structure and the habit of the plant indicate quite clearly that the species is a *Masdevallia*. Schlechter had occasion to study the species intensively when he prepared his enumeration of the orchids of Panama collected by C. W. Powell. In his revision of former views he reduced his *Scaphosepalum panamense* to synonymy under *Masdevallia Livingstoneana* Roezl & Reichb. f.

*Masdevallia Livingstoneana* has been numbered among those orchids which were inadequately described by Reichenbach. Until the Reichenbachian herbarium was opened it was impossible to obtain any evidence as to the aspect of the species, because Reichenbach "had given such a diagnosis that 'Oedipus himself would not have guessed the plant.' " In the original description no reference is made to the petals and labellum.

In Reichenbach's herbarium I was unable to find the type specimen of *Masdevallia Livingstoneana*. I did find, however, a water-color sketch of a flowering plant accompanied by a manuscript description which is almost word for word the description that was published in the *Gardeners' Chronicle*. Perhaps this water-color sketch was the only available evidence as to the floral characters, and served for a tentative description while the type plant which was sold at auction in London was being induced to grow and produce flowers. I am unable to explain on any other reasonable assumption Reichenbach's failure to describe the petals and labellum.

The specimens that I have examined of Schlechter's *Scaphosepalum panamense*—I refer to the type and to specimens given me by Mr. Powell—seem to be different from the plant represented by the water-color drawing referred to. The most conspicuous difference is found in the upper lobe of the calyx, this being elongated, erect and slender in *M. Livingstoneana*, but subequal to the lateral lobes of the calyx and sharply bent back in Schlechter's *Scaphosepalum panamense*. Another difference, which is clearly apparent,

is found in the more open throat of *Masdevallia Livingstoneana* caused by the lateral lobes of the calyx being deflexed as Reichenbach described them.

What I take to be *Masdevallia Livingstoneana* is represented by a specimen submitted by Mr. Powell. This is No. 78 of the Panama series. As far as one can tell by comparing a dried flower with a water-color drawing, this specimen is probably *M. Livingstoneana*, and may temporarily be taken to represent that species.

**Stelis cascajalensis** Ames sp. nov. Caules secundarii elongati, vaginati, monophylli. Folium coriaceum, oblongo-ellipticum, in sicco nervosum, usque ad basim attenuatum. Vagina pedunculi abbreviata, complanata. Pedunculus elongatus, folio multo longior. Bracteae inflorescentiae distichae, inter se distantes. Pedicellus cum ovario bracteam excedens, gracilis. Flores permagni, purpurei. Sepala lateralibus deltoideo-ovata, quinquenervia, obtusa. Sepalum dorsale simile. Petala valde incrassata, subflabellata, truncata. Labellum carnosum, quadrato-dolabriliforme, apice oblique truncatum, prope apicem minute apiculatum, apiculo erecto. Discus leviter excavatus, per medium leviter carinatus. Columna apice valde dilatata.

Secondary stems erect, 4.5 cm. or more long, for the most part concealed by an elongated tubular sheath, monophyllous. Leaf 10.5 cm. long, 2.7 cm. wide, elliptic-oblongate, obtuse, narrowed toward the base, much shorter than the peduncle. Sheath at base of peduncle in axil of the leaf 1 cm. long, complanate. Peduncle about 17 cm. long, floriferous nearly to the base, the raceme being 14 cm. long. Bracts of the raceme about 8 mm. apart, distichous, 3.5 mm. long, subinfundibuliform, obliquely truncate. Pedicel with the ovary up to 8 mm. long, slender, somewhat drooping. Flowers translucent, purplish, about 12 mm. in diameter when the sepals are spread out. Lateral sepals 5.5 mm. long, 6.5 mm. wide, deltoid-ovate, obtuse, 5-nerved. Dorsal sepal similar. Petals 1.5 mm. long, 2 mm. wide across the tip, fleshy-thickened, subflabellate, truncate. Labellum 1 mm. long, 1 mm. wide, quadrate-dolabriliform, obliquely

truncate in front, with an erect inconspicuous apicule near the apex. Disc shallowly excavated with a raised keel through the middle. Column about 1 mm. long, dilated upward.

In habit similar to *Stelis Lankesteri* Ames, from which it differs in the number of nerves in the sepals, in the regular not bilabiate flowers, and in the petals and labellum. The flowers are larger than in *Stelis leucopogon* Reichb. f. and *S. Tonduziana* Schltr.

COSTA RICA, Cascajal, C. H. Lankester 93. 5500 feet altitude. (Type in Herb. Kew.)

***Stelis inaequalis* Ames sp. nov.** Herba parvula, epiphytica. Caules secundarii dense caespitosi, erecti vel ascendentes, valde abbreviati, monophylli. Folium oblanceolatum, apice rotundatum, usque ad basim angustatum. Pedunculus quam folium multo longior, paucibracteatus, bracteis vaginantibus. Racemus plus minusve decemflorus. Flores in sicco atrobrunnei, bilabiati. Sepala lateralibus abbreviata, usque ad apicem plus minusve cohaerentia, laminam transverse ellipticam formantia, supra medium valde deflexa. Sepalum dorsale valde dissimile, oblongum, obtusum, trinervium. Petala flabellata, leviter incrassata. Labellum apice carnosum, subquadratum, trinervium, antice excavatum, truncatum, utrinque prope apicem minute lobulatum. Columna apice trilobata.

Secondary stems densely caespitose, up to 3 mm. long, concealed by an ample hyaline sheathing bract. Leaf about 2 cm. long, up to 5 mm. wide, oblanceolate, distinctly marginate, obscurely if at all bilobulate or bidentate at the obtuse tip, narrowed toward the base, coriaceous. Peduncle erect, with the raceme up to 5 cm. long, very slender, paucibracteate. Raceme 1.5 cm. long, about 5 mm. in diameter, ten or more flowered. Flowers dark brown, about 1 mm. apart. Bracts at the base of the pedicels infundibuliform, embracing the rachis, hyaline when dry. Pedicels hardly 1 mm. long. Lateral sepals 1 mm. long, coherent nearly to the apex, forming a transversely elliptical lamina which is 2 mm. wide, sharply deflexed at about the middle. Dorsal



sepal 2.5 mm. long, about 1 mm. wide, very unlike the lateral sepals, and with them giving a bilabiate aspect to the flower, 3-nerved, oblong, obtuse. Petals about .75 mm. long, broadly flabellate, thickened. Labellum .75 mm. long, subquadrate, rather thin below the middle, much thickened near the apex, strongly concave in front of the obtuse tip, 3-nerved. Column about equaling the petals in length, 3-lobed at the summit.

*Stelis inaequalis* is without near allies in the Central American flora. The unequal sepals and very distinctive labellum are differentiating characters.

PANAMA, Near San Juan in the foothills of the upper reaches of the Chagres River, C. W. Powell 272. Growing on upper side of large limbs of trees. Flowers chocolate-brown. Flowers in January and February. Sea level. (TYPE in Herb. Ames No. 23748.)

**Stelis Sanchoii** Ames *sp. nov.* In habitu *S. microchilae* Schltr. similitudinem gerit. Radices fibratae, patentes, albae, glabrae. Caules secundarii abbreviati, vaginati, nervis vaginarum in sicco longitudinaliter prominentibus, monophylli. Folium coriaceum, anguste elliptico-lanceolatum, in petiolum sulcatum elongatum contractum. Pedunculus cum racemo folium permulto excedens, infra racemum paucibracteatus. Racemus elongatus, multiflorus, vix flexuosus. Bractee inflorescentiae oblique infundibuliformes, in sicco brunneae, inter se satis distantes. Pedicellus cum ovario bractea vix longior. Flores bicolores. Sepala lateralibus usque ad medium cohaerentia, ovata, trinervia, obtusa. Sepalum dorsale simile. Petala flabellata, apice valde incrassata. Labellum valde incrassatum, basi breviter cuneatum, prope basim transverse calloso-incrassatum, antice semiorbiculare, oblique excavatum. Columna usque ad apicem dilatata, utrinque lobata.

Roots fibrous, whitish, spreading. Secondary stems caespitose, about 5 mm. long, concealed by tubular brownish sheaths, monophyllous. Sheaths nearly 1 cm. long, when dry prominently nervose. Leaf with the petiole about 2.5 cm. long, the narrowly elliptic-lanceolate lamina 1.5 cm.

long, 4-5 mm. wide, minutely tridenticulate at the subacute apex. Peduncle with the raceme up to 10.5 cm. long, floriferous to below the middle, subfiliform, with a few dilated infundibuliform bracts below the raceme. Bracts of the raceme 2 mm. long, surrounding the rachis, brownish in dried specimens, hardly shorter than the pedicels of the flowers. Lateral sepals hyaline, about 3 mm. long, 3 mm. wide, united to about the middle, broadly ovate, obtuse, 3-nerved, pale greenish. Dorsal sepal 3.5 mm. long, about 3 mm. wide, obtuse, 3-nerved, maroon. Petals 1 mm. long, slightly exceeding 1 mm. in width, flabelliform, much thickened along the apical margin. Labellum scarcely 1 mm. long, 1 mm. wide near the middle, the subcuneate base erect and nearly parallel to the column, provided with a transverse callus in front of the erect portion, the apical portion deflexed, semiorbicular, obtuse, obliquely excavated or shallowly concave. Column about as long as the petals, dilated above the middle, with an obtuse lobe on each side at the summit, posterior membrane of the clinandrium obscurely trilobed, the lobes obtuse.

It is distinguished in part from *Stelis Bradei* Schltr. by the shorter secondary stems and smaller leaves. It differs from *S. rhodochila* Schltr. in having twice larger flowers. In habit it suggests *S. microchila* Schltr., but is very dissimilar in the structure of the labellum.

COSTA RICA, La Estrella, C. H. Lankester & Alfredo Sancho 438, February 3, 1923. (TYPE in Herb. Ames No. 23732.)

**Pleurothallis amethystina** Ames sp. nov. Radices fibratae, albae. Caulis secundarii abbreviati, vaginati, monophylli. Folium anguste oblanceolatum, obtusum, obscure marginatum, pedunculo brevius. Pedunculus cum racemo folium multo excedens. Racemus quinque ad quindecimflorus, plus minusve secundus. Bractae flores subtendentes scariosae, infundibuliformes, oblique truncatae, acutae. Pedicellus cum ovario bracteis longior. Sepala lateralalia paene usque ad apicem cohaerentia, apice bidentata, laminam anguste ellipticam purpureo-villosam convexam

formantia, lamina subtus bicarinata. Sepalum dorsale anguste ellipticum, obtusum, prope basim valde concavum, subtus per medium valde unicarinatum, supra pilis longiusculis purpurcis appressis adpersum. Petala amethystina, columnam aequantia, oblonga, glabra, abrupte acuta, carnosa. Labellum amethystinum, inaequaliter trilobatum; lobis lateralibus erectis, porrectis, oblongis, obtusis, basi truncatis; lobo medio permagno, oblongo, apice obtuse rotundato, glabro. Discus supra basim lobi terminalis bicarinatus, carinis valde incrassatis, prope unguem brevem bicallosus. Columna leviter arcuata, androclinio minute denticulato.

Secondary stems 1–1.5 cm. long, slender, concealed by a tubular closely appressed sheath, monophyllous. Leaf 6–9 cm. long, 5–12 mm. wide. Peduncle with the raceme 6–15 cm. long, with the flowers about 5 mm. apart. Floral bracts up to 3 mm. long. Pedicel with the ovary up to 5 mm. long. Lateral sepals 8 mm. long, united to form a narrowly elliptical lamina which is bidentate at the tip, villose on the upper surface, more densely so near the margin than in the centre; when spread out the lamina is about 3 mm. wide. Petals 3 mm. long, 2 mm. wide. Labellum with the short claw 4 mm. long; lateral lobes basal, 2 mm. long, .75 mm. wide; middle lobe 3 mm. long, about 1.5 mm. wide. Column about 3 mm. long, at base produced into a short foot.

Closely allied to *Pleurothallis Wercklei* Schltr., *P. canae* Ames, *P. Johannis* Schltr., *P. bifalcis* Schltr. and several other species of the Central American orchid flora. From *P. Wercklei*, with which it has been confused, it differs conspicuously in having the lateral lobes of the labellum much broader in relation to their length, in the truncate base of the lip forming with the claw a right angle on each side, and in the tip of the petals being abruptly acute, not triangular acute and obscurely trilobed when spread out.

GUATEMALA, Department of Alta Verapaz, Samác, Harry Johnson 878, October 20, 1920. Flowers purplish. 4000 feet altitude. (TYPE in Herb. Ames No. 21282.);

Cobán, *H. v. Tuerckheim* 3997, November 1912. 1550 meters altitude.

***Pleurothallis arietina* Ames sp. nov.** Radices graciles, fibratae. Caules secundarii valde elongati, conspicue alati, paucivaginati. Vaginae caulis elongatae, arcte appressae. Folium lanceolatum, acutum, coriaceum. Flores fasciculati, quam folium multo breviores, e spatha complanata orientes. Sepala lateralibus usque ad apicem cohaerentia, laminam concaviusculam oblongam formantia. Sepalum dorsale simile. Petala unguiculata, supra unguem oblonga, triquetra, obtusa, valde incrassata, minute et breviter glandulosa. Labellum unguiculatum, explanatum triangulari-crescentiforme, longe auriculatum auriculis porrectis, antice valde incrassatum, glandulosum. Discus callo transverso in basi et carina incrassata in medio. Columna elongata, antice prope basim callo instructa, usque ad apicem minute glandulosa.

Roots fibrous. Secondary stems 20–25 cm. long, conspicuously alate, provided above with two elongated closely appressed cylindrical sheaths, one near the middle of the stem, the other basal, monophyllous. Leaf up to 8.5 cm. long, 3.5 cm. wide below the middle, lanceolate, rounded at base, acuminate, acute, coriaceous, longer than the inflorescence. Flowers fasciculate in the axil of the leaf, the pedicels arising from a complanate sheath. Flower-stalks about 3 cm. long, slender, subfiliform. Lateral sepals 9 mm. long, united to the tip, forming a more or less fleshy, oblong, navicular lamina which is about 3 mm. wide when spread out. Dorsal sepal 8 mm. long, similar to the lamina formed by the lateral sepals, 3-nerved, the nerves prominent. Petals 8 mm. long, 1 mm. wide, unguiculate, oblong above the claw and triquetrous-thickened, subacute, minutely glandular. Labellum suggesting a ram's head when spread out, about 2 mm. long to the base of the slender claw, triangular-crescentiform when the lateral lobes which are normally porrect are spread out, acute, 2 mm. wide in front of the basal porrect auricles which are 1 mm. long and narrowly triangular-acute, apical third of the labellum



thickened, minutely glandular. Disc with a T-shaped callus in front of the claw. Column 3 mm. long, minutely glandulose, with a cornute projection near the base in front.

This appears to be a near ally of *Pleurothallis crocodiliceps* Reichb. f., but is much taller, with shorter, broader leaves, and with the sepals very much broader than the petals.

COSTA RICA, Cartago, La Estrella, C. H. Lankester & Alfredo Sancho s. n. Flower Pinard-yellow (Ridgway). Labellum spotted with purple. (TYPE in Herb. Ames No. 23161.)

***Pleurothallis cachensis* Ames sp. nov.** Caules secundarii valde elongati, vagina tubulata laxè appressa vestiti, monophylli. Vagina scariosa in sicco, usque ad apicem leviter dilatata. Folium lineari-oblongum, obtusum, utrinque attenuatum, racemum multo excedens, sessile. Pedunculus cum racemo usque ad medium folii extensus, e vaginis spathaceis oriens. Racemus subdistichiflorus. Bracteae flores subtendentes satis approximatae, infundibuliformes. Sepala lateralìa supra medium libera, basi valde saccata, laminam ovatam bifidam formantia. Sepalum dorsale linearc, acutum. Petala linearìa, acuta, uninervia, sepalis multo breviora. Labellum sagittatum, marginibus basilaribus erectis. Columna utrinque dentata, post antheram denticulata.

Secondary stems up to 14 cm. long, slender, with an elongated scarious sheath below the middle, monophyllous, hardly 2 mm. thick. Sheath 4.5 cm. long, more or less inflated toward the obtuse tip. Leaf about 10 cm. long, up to 9 mm. wide, very coriaceous, two or more times longer than the inflorescence, linear-oblong. Peduncle with the raceme up to 1.5 cm. long, arising from a scarious complanate sheath. Raceme about 4 cm. long, about 18-flowered. Bracts of the raceme infundibuliform, dilated upward, 3-4 mm. long, interbracteal spaces 1 mm. long. Ovary about 1 mm. long. Lateral sepals united beyond the middle, 8 mm. long; united portion when spread out ovate, acuminate, bifid, 4 mm. wide, when in natural position forming a

strongly concave sac-like base within which the labellum is concealed; free portion of each sepal linear-triangular, acute, 3-3.5 mm. long; mid-nerve of each lateral sepal forming a prominent carina on the outer surface. Dorsal sepal 8 mm. long, fleshy, hardly 1 mm. wide above the base, linear, acute, 1-nerved, the margins somewhat involute. Petals about 3 mm. long, linear, acute, very delicate in texture. Labellum 3 mm. long, unguiculate, 2 mm. wide between the lateral lobes when spread out, sagittately 3-lobed, acute; basal lobes erect, rounded, slightly retrorse, forming a cordate base in front of the slender thickened claw; middle lobe 2 mm. long, 1 mm. wide. Disc ecallose. Column 2.5 mm. long, with an erect tooth on each side at the summit in front. Clinandrium minutely denticulate behind the anther.

In habit not unlike *Pleurothallis rufa* Rolfe, but very different from that species in the structure of the inflorescence.

COSTA RICA, Cachi, C. H. Lankester 76. Leaves Andover-green (Ridgway). Flowers honey-yellow (Ridgway), pendent. 3750-4000 feet altitude. (TYPE in Herb. Kew.)

***Pleurothallis cedralensis* Ames sp. nov.** Herba epiphytica, ramosa, vagula. Caules plus minusve erecti, polyphylli, vaginis hispidulis tubulatis obtecti. Folia valde coriacea, anguste elliptica, apice bilobulato apiculo obtuso interjecto, vix petiolata. Racemus simplex, clongatus septem ad decemflorus, glaber. Bractcae inflorescentiae infundibuliformes. Pedicelli graciles, ascendentes, glabri. Flores sulphurei, delicatuli. Sepala lateralialia lineari-triangularia, usque ad apicem attenuata, patentia, uninervia. Sepalum dorsale lanceolatum, acuminatum, acutum, trinervium. Petala elliptico-lanceolata, quam sepala multo breviora, subacuta, uninervia. Labellum trilobatum, usque ad medium cuneato-dilatatum lobos laterales obtusos formans, lobo medio lineari-oblongo, uninervio, minute papilloso. Discus infra medium labelli trinervius. Columna gracilis, prope medium constricta.

## CENTRAL AMERICAN ORCHIDS

Stems more or less straggly, elongated, concealed by hispidulous sheaths which are obliquely truncate and acute, leafy. Leaves up to 8 mm. long, about 3 mm. wide, narrowly elliptical, coriaceous, obscurely bilobed with a blunt apicule at the apex, narrowed to a sulcate base. Peduncle with the raceme about 2-5 cm. long, smooth. Raceme 2 cm. long, 7-10-flowered, flexuose. Bracts of the raceme infundibuliform, minute. Pedicel with the ovary about 2.5 mm. long, very slender. Flowers sulphur-yellow when fresh, membranaceous, more or less hyaline when dry. Lateral sepals 5 mm. long, about 1.25 mm. wide at the base, linear-triangular, subcaudate at the tip, at base forming with the front of the column a distinct mentum, 1-nerved. Dorsal sepal 5.5 mm. long, narrowly lanceolate, acuminate, acute, 3-nerved, strongly concave at base. Petals 3 mm. long, 1 mm. wide near the middle, elliptic-lanceolate, obtuse, 1-nerved. Labellum membranaceous, 3.5 mm. long, gradually dilated from the base up to the middle, becoming 1.5 mm. wide at this point where it is abruptly contracted to form the linear-oblong terminal half, 3-nerved up to the middle, 1-nerved beyond the middle, thickened at the tip. Column 3 mm. long including the foot, narrowed toward the middle, dilated at the summit. Pollinia two.

In habit similar to *Pleurothallis cabellensis* Reichb. f., but very different from that species in the structure of the flowers.

COSTA RICA, Cedral, *C. H. Lankester* 352, July 28, 1919. Flowers sulphur-yellow (Ridgway), lip pale greenish yellow (Ridgway). Leaves spinach-green (Ridgway), becoming purple with age. 5000 feet altitude. (TYPE in Herb. Kew.); La Estrella de Cartago, *Lankester & Sancho* 399, January 1923. (Herb. Ames No. 23157.); Cachi, *Lankester* 80, November 1916. Flowers very pale yellowish green. (Herb. Kew.)

***Pleurothallis cerea* Ames sp. nov.** Caules secundarii elongati, validi, monophylli. Folium anguste ellipticum, basi conduplicatum, usque ad apicem attenuatum. Flores congesti, prope apicem caulis secundarii orientes. Sepala

lateralia usque ad basim libera, ligulato-oblonga, obtusa, membranacea. Sepalum dorsale simile. Petala ligulato-oblonga, obtusa, trinervia, membranacea. Labellum oblongum, obtusum, simplex, trinervium. Columna carnosae.

Secondary stems about 20 cm. long, 5 mm. thick near the inflorescence, with several elongated tubular closely appressed sheaths. Leaf 17 cm. or more long, 6.3 cm. wide, narrowly elliptic, conduplicate at the base. Flowers numerous, crowded. Peduncles much abbreviated. Pedicellate ovary about 6 mm. long. Lateral sepals 8 mm. long, 2 mm. wide, free, ligulate-oblong, obtuse, 3-nerved, each lateral nerve with a supplementary branch. Dorsal sepal 9 mm. long, 2 mm. wide, ligulate-oblong, obtuse, somewhat thickened. Petals about 8 mm. long, about 2 mm. wide, 3-nerved, similar to the lateral sepals. Labellum 3 mm. long, 1 mm. wide, oblong, obtuse, 3-nerved, simple, truncate at the base, mobile on the foot of the column, fleshy, thickened on the basal margin. Column 2.5 mm. long, produced into a conspicuous foot. Clinandrium entire.

Allied to *Pleurothallis octomcrioides* Lindl., from which it differs in the shape of the leaf and structure of the labellum.

COSTA RICA, Agua Caliente, C. H. Lankester 358. Labellum with a submarginal purple line; flowers waxy in consistency. Anther purple. (TYPE in Herb. Kew.)

***Pleurothallis crescentilabia* Ames sp. nov.** Caules secundarii elongati, validi, monophylli. Folium ovatum, usque ad apicem angustatum, coriaceum, in sicco nervosum, basi subcordatum, in petiolum conduplicatum brevem contractum. Flores glomerati. Sepala lateralialia usque ad apicem cohacrentia, laminam ovato-lanceolatam formantia, basi valde concava, extus nervis prominentibus. Sepalum dorsale lanceolatum, acuminatum, acutum, trinervium, nervis prominentibus, concavum. Petala valde incrassata semiteretia, lincaria, usque ad apicem angustata, sepala aequantia. Labellum crescentiforme, basi arrectum statim deflexum, auriculis post columnam attingentibus. Columna brevis, simplex vix in pedem producta.



## CENTRAL AMERICAN ORCHIDS

Secondary stems erect, about 17 cm. long, up to 5 mm. thick, monophyllous, vaginate, the sheaths tubular and elongated. Leaf 17.5 cm. long, 8 cm. or more wide, ovate, gradually tapering from below the middle to the pointed tip, coriaceous, many-nerved, the nerves conspicuous in dried specimens, base subcordate, contracted into a short petiole. Petiole more or less conduplicate, 8 mm. long. Flowers crowded, springing from a dense cluster of scarious bracts. Pedicels about 5 mm. long. Lateral sepals 11 mm. long, united throughout their length, forming a strongly concave ovate-lanceolate lamina, which is provided on the outside with several carinate or thickened nerves. Dorsal sepal about 12 mm. long, lanceolate, acute, 3-nerved, the median nerve prominent. Petals 11 mm. long, about 1 mm. wide near the middle, linear, semiterete, rounded on the outer side, tapering gradually to the tip, 3-nerved. Labellum crescentiform when seen from above, the horns of the crescent touching or overlapping behind the column; basal half erect; apical half sharply bent downward, and partly coherent to the basal half, 3 mm. wide, very fleshy. Column 1.5 mm. long, somewhat constricted near the middle.

In habit resembling *Pleurothallis cardiothallis* Reichb. f., *P. acutipetala* Schltr. and *P. glomerata* Ames, but wholly distinct in the structure of the flower.

COSTA RICA, Without exact locality, *C. H. Lankester* 359. Sepals hyaline, the upper one with three, the lower with four purple stripes. Petals deep port-wine-purple. Anther-cap yellow. Labellum horseshoe-shaped enclosing the column. Lateral sepals connate, cochleate. (TYPE in Herb. Kew.)

***Pleurothallis glomerata* Ames sp. nov.** Herba epiphytica, valida. Caules secundarii elongati, monophylli. Folium anguste lanceolatum, in petiolum sulcatum contractum. Flores congesti in axillis petioli. Sepala lateralia usque ad apicem cohaerentia, linearia. Sepalum dorsale lanceolatum, acuminatum, basi valde concavum. Petala linearia, trinervia. Labellum abbreviatum, circuitu ovatum,

## CENTRAL AMERICAN ORCHIDS

acutum, obscure trilobatum, supra medium valde deflexum. Columna ebrachiata.

Epiphytic herb up to 44 cm. tall. Secondary stems about 3 mm. in diameter in dried specimens, monophyllous. Leaf 16 cm. long, 5.3 cm. wide, narrowly lanceolate or elliptic-lanceolate, contracted at base into an elongated sulcate petiole which is about 2.5 cm. long. Flowers in a dense cluster near the base of the petiole, glomerate, spreading on slender pedicels, yellowish. Pedicels with the ovary about 9 mm. long, very slender, sheathed by an ample hyaline bract near the base. Lateral sepals 8-9 mm. long, united to the tip, forming a linear 4-nerved lamina which has involute margins. Dorsal sepal 8 mm. long, 2.5 mm. wide below the middle, strongly concave at the base, lanceolate, acuminate, 3-nerved, the nerves prominent on the exterior surface. Petals 7 mm. long, up to 1 mm. wide, linear, tapering gradually to the acute tip, 3-nerved. Labellum fleshy, 2 mm. long, hardly 2 mm. wide at the base, ovate in outline, obscurely 3-lobed; lateral lobes rounded; middle lobe 1 mm. long, triangular, acute, 3-nerved. Column about 1 mm. long, simple.

Similar in habit to *Pleurothallis ruscifolia* R. Br., but larger throughout, with a 3-lobed labellum. From *P. ventricosa* Lindl., which it resembles in general aspect, it differs conspicuously in the structure of the labellum.

COSTA RICA, Cachi, C. H. Lankester 357. (TYPE in Herb. Kew.)

***Pleurothallis Nelsonii* Ames sp. nov.** Radices fibratae, albidae. Caules secundarii elongati, superne valde alati, complanati, vaginis quattuor instructi. Vaginae caulis secundarii tubulatae, elongatae, in sicco brunneae. Folium anguste oblongo-lanceolatum, acuminatum, acutum. Pedunculus filiformis, uniflorus. Sepala lateralia paene usque ad apicem cohaerentia, laminam ligulatam formantia. Sepalum dorsale simile. Petala linearia, acuta, minute glandulosa, prope apicem incrassata, prope basim in unguem carinatum contracta. Labellum unguiculatum, valde glanduloso-pubescent, in auriculas lineari-triungulares

## CENTRAL AMERICAN ORCHIDS

productum, antice triangulari-subacutum. Unguis labelli gracilis, membranaceus. Discus prope unguem callo permagno instructus. Columna gracilis, minute glandulosa, antice supra unguem labelli prominens.

Roots fibrous, whitish, smooth. Secondary stems about 12 cm. long, conspicuously two-winged above, clothed with four tubular closely appressed sheaths, the uppermost 3.5 cm. long, brownish when dry. Leaf 7 cm. long, about 2 cm. wide near the middle, oblong-lanceolate, acuminate, acute, coriaceous, shortly conduplicate at base. Peduncle slender, about 3.5 cm. long, with a tubular bract near the middle, 1-flowered. Lateral sepals about 1 cm. long, coherent nearly to the apex, forming a narrowly elliptical lamina which is 3 mm. wide near the middle and shortly bidentate at the tip. Dorsal sepal similar, 1 cm. long, acute, 3-nerved, the nerves prominent on the inner surface. Petals 8.5 mm. long, hardly 1 mm. wide, linear-falcate, acute, thickened on the anterior margin, minutely glandulose, contracted near the base to form a narrowly oblong claw which is heavily carinate along the middle on the outer surface. Labellum 2 mm. long from the point of insertion to the tip, when spread out suggestive of a ram's head, the lateral lobes or auricles representing the horns, the triangular middle lobe representing the head; lateral lobes 2 mm. long, probably correct, narrow, acute, glandular-hairy; middle lobe hardly 1 mm. long, obtuse, densely glandular-hairy. Disc with a prominent callus in front of the claw and a thickened median nerve. Column 3 mm. long, densely puberulous, with a small projection in front near the base.

Closely allied to *Pleurothallis arietina* Ames, from which it is readily distinguished by means of the flattened petals which are only thickened on the anterior margin and not at all triquetrous. Vegetatively it is a smaller plant.

MEXICO, State of Chiapas, Chicharras, E. W. Nelson 3763, February 6, 1896. 3000-6000 feet altitude. (TYPE in Herb. Ames No. 7885.)

**Pleurothallis pergrata** Ames sp. nov. Herba epiphytica. Radices graciles, fibratae. Caules secundarii valde elongati, monophylli, vaginis angulosis muricatis vestiti. Vaginae tubuliformes, apice dilatatae, marginatae. Folium coriaceum, ellipticum, apice bidentatum apiculo interjecto, marginatum, breviter petiolatum vel basi conduplicatum. Flores fasciculati, folium vix aequantes. Sepala lateralialia prope basim cohaerentia, lineari-lanceolata, in caudam perlongam producta, subtus leviter carinata. Sepalum dorsale valde concavum, lanceolatum, in caudam longissimam terminans, trinervium. Petala late spathulata, obtusa, uninervia, columnam superantia. Labellum subpanduriforme, membranaceum, basi valde concavum, extus per medium leviter carinatum, obtusum, intus ecarinatum. Columna gracilis, rostello elongato permagno.

Epiphytic herb. Roots finely fibrous, spreading. Secondary stems 2.5–6 cm. long, slender, caespitose, monophyllous, concealed by elongated muricate angulate sheaths .5 mm. in diameter. Sheaths about five in number, 5 mm. long, closely appressed, the muriculate appendages whitish and spreading, apex of each sheath dilated, marginate, acute. Leaf 1.5–2 cm. long, up to 7 mm. wide, elliptical, obtuse, bidentate at the tip with a short apicule between the teeth, marginate, narrowed at the base into a conduplicate petiole. Flowers fasciculate, arising from the axil of the leaf, the pedicels hardly equaling the petiole in length. Lateral sepals about 1.8 cm. long, for the most part free, hardly 2 mm. wide where they are joined, free portion linear-lanceolate and prolonged into a filiform tail, lightly carinate on the outer surface through the middle, membranaceous, hyaline, tinged with pink-purple when dry, the tails yellowish. Dorsal sepal 1.8 cm. long, about 2 mm. wide near the base, lanceolate, similar to the lateral sepals, 3-nerved. Petals 2.5 mm. long, about 1 mm. wide at the middle, broadly spatulate, obtuse, membranaceous, similar to the sepals in texture, 1-nerved, margin obscurely glandular. Labellum 4 mm. long, basal margin erect, apical margin deflexed, subpanduriform when spread out, obtuse, with a concave base, mid-nerve prominent on the outer surface,



in texture similar to the petals, ecallose. Column 2 mm. long, rostellum dilated, deflexed over the stigma.

In habit *Pleurothallis pergrata* resembles *Pleurothallis Williamsii* Ames, a native of Panama, but differs in having the flower-stalks much shorter than the leaves, in the caudate sepals and in the dissimilar labellum which lacks carinae on the upper surface.

COSTA RICA, Cartago, La Estrella, C. H. Lankester & Alfredo Sancho 436. Flowers pansy-purple (Ridgway). 5000 feet altitude. (TYPE in Herb. Ames No. 23721.)

***Pleurothallis saccata* Ames sp. nov.** Caules secundarii elongati, validi, erecti, monophylli. Folium ellipticum vel ovato-ellipticum, valde coriaceum, basi cordatum. Pedunculi folium aequantes, fasciculati. Bractee infra racemum tubulatae, arcte appressae, apice vix dilatatae. Bractee flores subtendentes anguste infundibuliformes. Racemus arcuatus, floribus numerosis secundis purpureo-maculatis. Sepala lateralibus usque ad apicem cohaerentia, saccum semiovatum formantia, extus utrinque carinata, carinis usque ad apicem extensis. Sepalum dorsale ellipticum, obtusum, trinervium, porrectum. Petala clavato-spathulata, supra medium valde incrassata, obtusa. Labellum basi arrectum, statim deflexum, basi ipsa columnam amplectenti, valde incrassatum, oblongum, apice rotundatum, minute apiculatum, basi cordatum, auriculis basilaribus retrorsis leviter incurvis triangularibus. Discus bicallosus, callis prope basim labelli prominentibus. Columna carnosa.

Epiphytic herb. Secondary stem stout, elongated, erect, 4 mm. in diameter near the base of the leaf. Leaf incomplete, apparently up to 15 cm. long, 9 cm. more or less wide, ovate-elliptic, leathery, rigid, nervose, cordate at base. Peduncles fasciculate, four or five in each fascicle, with the raceme up to 10 cm. long. Bracts below the raceme about 4 mm. long, closely appressed, tubular, hardly dilated at the summit. Bracts of the raceme about 3.5 mm. long, tubular, hardly dilated, obliquely truncate at the apex. Pedicellate ovary about 4 mm. long. Flowers more or less secund, cream color spotted with purple, globular in aspect. Lateral

sepals 5 mm. long, united up to the apex, forming a deep semiovate sac which is bicarinate on the outside with the carinae converging and united at the tip of the sac. Dorsal sepal 4.5 mm. long, 2.5 mm. wide, elliptic, obtuse, 3-nerved, forwardly inclined. Petals 2 mm. long, clavate-spatulate, obtuse, conspicuously thickened above the middle, 3-nerved. Labellum 2 mm. long, 1 mm. wide, oblong, rounded at the tip, apiculate, cordate at the base, the auricles retrorse and closely appressed to the column. Disc bicallose, with a protuberant rounded callus on each side near the base, one in front of each triangular auricle. (Seen from the side, the erect base of the labellum appears to have fused with the abruptly deflexed pendent apical part.) Column fleshy, 1.75 mm. long. Pollinia two, slenderly pyriform.

In habit similar to *Pleurothallis Pittieri* Schltr., but in floral structure entirely different from it. It would seem that this species after anthesis becomes much larger in its vegetative parts. The labellum is similar to that of *P. geniculata* Lindl.

COSTA RICA, Cascajal, C. H. Lankester K340. When fully developed over one meter high. (TYPE in Herb. Kew.)

***Pleurothallis Sanchoii* Ames sp. nov.** Radices graciles. Caules secundarii elongati, folium multo excedentes, erecti, monophylli. Folium ellipticum. Flores fasciculati. Pedunculus cum flore vix folium aequans, gracilis, uniflorus. Pedicellus cum ovario elongatus. Sepala lateralalia usque ad apicem cohaerentia, laminam suborbicularem quadrinerviam formantia. Sepalum dorsale multo angustius, obtusum, trinervium. Petala lineari-triangularia, apice incrassata, acuta, uninervia, leviter curvata. Labellum rotundato-cordatum, acutum, carnosum, ecallosum. Columna carnosae, prope medium constricta.

Roots slender, whitish, spreading. Secondary stems 2.5–6 cm. long, shorter when immature, very slender, with about two closely appressed cylindrical sheaths, monophyllous. Leaf up to about 3 cm. long, usually not exceeding 2.6 cm. in length, about 11 mm. wide near the middle, elliptical, coriaceous, exceeding the slender peduncle

in length. Inflorescence fasciculate. Peduncle with the flower about 2 cm. long. Lateral sepals 5 mm. long, coherent to the tip, forming a suborbicular lamina which is about 5 mm. wide at the middle and 4-nerved nearly to the tip. Dorsal sepal 6 mm. long, about 3 mm. wide, concave, narrowly elliptical, obtuse, 3-nerved. Petals 4 mm. long, linear-triangular, acute, subtriquetrous above the middle, thickened at the tip, 1-nerved. Labellum fleshy, 2 mm. long from point of insertion to the tip, orbicular-cordate, apiculate, auricles of the cordate base obtuse. Disc ecallose. Column about 2 mm. long, with an abbreviated foot, fleshy, entire at the apex, constricted near the middle.

In the structure of the flower somewhat resembling *Pleurothallis leucantha* Schltr., but dissimilar to it in the cordate base of the labellum. Habitally very distinct from *P. leucantha* in having elliptical leaves.

COSTA RICA, La Estrella, C. H. Lankester & Alfredo Sancho 394, January 9, 1923. Sepals hyaline, greenish. Petals delicate purple. Borders of labellum purplish. (TYPE in Herb. Ames No. 23159.)

**Lepanthes cascajalensis** Ames sp. nov. Radices fibratae, elongatae. Caules secundarii caespitosi, vaginis glabris vestiti, monophylli. Vaginae arcte amplexentes, ostio dilatatae, ovatae, acuminatae, marginatae. Folium elliptico-lanceolatum, valde acuminatum, in sicco purpureo-tinctum, coriaceum, apice tridentatum. Pedunculus cum racemo folio brevior. Flores succedanei. Sepala lateralialia usque ad medium cohaerentia, ovata, acuminata, acuta, extus carinata, binervia, glabra. Sepalum dorsale ovatum, acuminatum, acutum, trinervium. Petala transverse sublanccolata, utrinque obtusa, post columnam attingentia, partibus anterioribus labellum aequantibus, trinervia. Labellum parvulum, bipartitum; lobis lateralibus anguste oblongo-ellipticis, obtusis, carosis; lobo medio subobsoleto, glanduloso. Columna integra vel obscure lobata.

Roots fibrous, spreading, slender. Secondary stems 6-12 cm. long, concealed by ten to eleven glabrous sheaths, monophyllous. Sheaths closely appressed, dilated at the

apex into an ovate acuminate marginate lamina. Leaf 2.5–5 cm. long, 8–13 mm. wide, when dry more or less tinged with purple, elliptic-lanceolate, acuminate, rather suddenly contracted near the acuminate tridentate tip. Peduncle with the raceme 2 cm. or more long, very slender. Flowers large, opening in succession. Lateral sepals 6 mm. long, 2-nerved, united almost to the middle, ovate, acuminate, acute, with four external carinae, membranaceous, fused portion 6 mm. wide, free portion of each sepal 3.5 mm. wide, triangular, 4 mm. long from the tip to the point of fusion. Dorsal sepal 6.5 mm. long, 3.5 mm. wide, triangular-ovate, abruptly acuminate, acute, 3-nerved. Petals 3-nerved, overlapping behind the column, transversely asymmetrically lanceolate, 4.5–5 mm. wide; posterior lobe 3 mm. long, 2 mm. wide, round-obtuse; anterior lobe 2 mm. long, 1 mm. wide, tapering gradually to the obtuse tip. Labellum 2 mm. long, conspicuously 2-lobed; lateral lobes hardly 1 mm. wide, parallel, narrowly oblong-elliptical, obtuse, unguiculate from the middle; middle lobe much abbreviated, subobsolete, glandulose. Column 2 mm. long, entire or obscurely lobed at the summit.

Allied to *Lepanthes eciliata* Schltr., from which it differs in the smooth vegetative parts, in the larger flowers, and in the different petals and labellum.

COSTA RICA, Cascajal, C. H. Lankester K350. Sepals bronze-red, petals dull, deep rose. (TYPE in Herb. Kew.)

***Lepanthes Chameleon* Ames sp. nov.** Herba epiphytica, caespitosa. Caules secundarii elongati, vaginis muricatis obtecti, monophylli. Folium ellipticum, apice tridenticulatum, marginatum, basi breviter conduplicatum. Pedunculi folium excedentes, singuli vel fasciculati, filiformes, infra racemum paucibracteati. Racemus flexuosus, pedicellis oblique ascendentibus. Sepala lateralia usque ad medium cohaerentia, laminam lanceolatam bicaudatam formantia, supra dense et longe glandulosa, margine ciliato-glandulosa. Sepalum dorsale ovatum, acuminatum, longe caudatum, margine ciliato-glandulosum, intus glabrum, extus nervis tribus conspicue glandulosis instructum. Petala



latiora quam longiora, minute glanduloso-puberula, transverse bilobata, lobo posteriore oblongo, obtuso, lobo anteriore lineari, subacuto. Labellum trilobatum; lobis lateralibus anguste ellipticis, c medio unguiculatis, per medium carinatis ut videtur, glanduloso-puberulis, margine glanduloso-ciliatis; lobo medio partem anteriorem loborum lateralium vix demidio aequanti, lineari, dense glanduloso, apice bulboso. Columna apice valde cuneato-dilatata. Pollinia duo, anguste pyriformia.

Epiphytic herb, caespitose. Roots fibrous. Secondary stems erect or ascending, up to 9 cm. long, slender, concealed by about ten elongated closely appressed sheaths which are about 7 mm. apart. Sheaths densely muricate, dilated at the tip, the expanded portion marginate. Leaf up to 3.5 cm. long, 9-11 mm. wide, elliptical, tridenticulate at the tip, narrowed below into an abbreviated conduplicate base. Peduncle up to 4 cm. long, three or more flowered, the flowers opening in succession. Raceme up to 2 cm. long, flexuose. Pedicels obliquely ascending. Lateral sepals up to 2.4 cm. long, 6 mm. wide near the base, coherent up to the middle, forming a lanceolate-bicaudate lamina, densely glandulose-hairy on the upper surface, apparently yellow tinged with purple when fresh, fading to yellow as the flowers mature. Dorsal sepal about 2 cm. long, up to 6 mm. wide near the base, ovate-acuminate, terminating in a slender caudate tip, glandular-ciliate on the margin, smooth on the inner surface, glandulose on the outer surface on the three prominent nerves, the mid-nerve deeply carinate. Petals 5 mm. wide, hardly .75 mm. long opposite the point of insertion, posterior portion oblong, 2 mm. long, anterior portion linear, 3 mm. long. Labellum glandulose, 1.25 mm. long, 3-lobed; lateral lobes elliptic, 1.25 mm. long; middle lobe porrect between the lateral lobes, linear, half as long as the anterior portion of the lateral lobes, densely glandular. Column about 2 mm. long.

In habit similar to *Lepanthes horrida* Reichb. f., from which it differs in the middle lobe of the labellum and in the outline of the petals. The lateral sepals appear to have been yellow suffused with purple, the upper sepal deep

purple, the tails of the sepals yellow. As the flowers mature the purple fades away.

COSTA RICA, Near Cartago, *C. H. Lankester s. n.* (TYPE in Herb. Ames No. 23722.)

***Lepanthes estrellensis* Ames sp. nov.** Radices fibratae. Caules secundarii caespitosi, erecti vel ascendentes, vaginis breviter muricatis vestiti, monophylli. Vaginae elongatae, arcte appressae, apice marginatae, vix dilatatae. Folium ellipticum, apice tridenticulatum, basi breviter conduplicatum. Pedunculi plus minusve duo, folio breviores. Bractae inflorescentiae scariosae, valde ciliato-glandulosae. Pedicelli distichi, rigidi, persistentes, bracteis multo longiores. Sepala lateralibus usque ad medium cohaerentia, ovato-lanceolata, acuta, laminam latam ovatam bilobam formantia, glabra. Sepalum dorsale oblongo-ovatum, breviter acuminatum, acutum, trinervium, glabrum. Petala bilobata, lobis subaequalibus divaricatis obtusis, glabra, margine inconspicue et minute glanduloso-ciliata. Labellum bilobatum, lobis subreniformibus, lobo medio ut videtur obsoleto. Columna usque ad apicem dilatata.

Secondary stems up to 9 cm. long, clothed throughout their length with shortly muricate sheaths, monophyllous. Sheaths about six, closely appressed, 1.5 cm. long, dilated at the tip, the triangular-acute apex marginate. Leaf 4-5 cm. long, up to 2.6 cm. wide, elliptical, tridenticulate at the apex, coriaceous. Peduncle with the raceme about 2 cm. long, slender. Raceme 5 mm. long, more or less, with scarious, glandulose bracts. Pedicels about 2 mm. long, distichous. Flowers opening in succession. Lateral sepals about 6 mm. long, united to about the middle, 5 mm. wide near the base, the free portion 3 mm. wide. Dorsal sepal 5.5 mm. long, 4 mm. wide, united at base with the lateral sepals. Petals bilobed, the lobes oblong obtuse and obliquely divaricate, the anterior lobe 4 mm. long, 1 mm. wide, the posterior one 4.5 mm. long and 1 mm. wide. Labellum bilobed, the middle lobe apparently obsolete, lobes reniform, 3 mm. long, 2 mm. wide. Column 2 mm. long, dilated toward the summit.

Plant similar to *Lepanthes eciliata* Schltr., from which it differs in having muricate sheaths on the secondary stems and dissimilar perianth segments.

COSTA RICA, Cartago, La Estrella, C. H. Lankester & Alfredo Sancho 385, January 9, 1923. Bracts of the stem blackish. Sepals pale hyaline green, labellum and lobes of the column pale yellowish green, front of column and central portion of the two lower lobes of the labellum red-purple. (TYPE in Herb. Ames No. 23602.)

**Lepanthes micrantha** Ames sp. nov. Radices fibratae, copiosae. Caules secundarii dense caespitosi, vaginis muriculatis vestiti, monophylli. Vaginae elongatae, nervis muriculatis, apice dilatatae, laminam ovato-lanceolatam acutam formantes. Folium ellipticum vel elliptico-lanceolatum, apice aequaliter bidentatum apiculo interjecto, coriaceum. Pedunculi breves, folio multo breviores. Flores succedanei. Sepala lateralibus usque ad medium cohaerentia, laminam orbicularem bilobatam margine ciliatam formantia; lobis triangularibus, acutis. Sepalum dorsale oblongum, acutum, trinervium. Petala transverse elongata, anguste elliptica, apicibus obtusis, margine minute ciliata. Labellum trilobatum; lobis lateralibus columnae appressis, supra medium expansis et transverse ellipticis, columnam amplectentibus, ciliatis; lobo medio brevi, ciliato. Columna brevis, superne dilatata.

Roots fibrous, tangled, spreading. Secondary stems about 4 cm. long, densely caespitose, concealed by elongated sheaths which are densely and finely muriculate on the longitudinal nerves, monophyllous. Sheaths five to six, about 7 mm. long, expanded at the tip into an ovate-lanceolate acuminate lamina. Leaf 1.5-2 cm. long, about 6 mm. wide, obtusely bidentate at the tip with an apicule between the teeth, elliptic or elliptic-lanceolate, coriaceous, contracted at base. Racemes several, with the peduncle 7-10 mm. long. Bracts of the raceme diaphanous, densely glandular, nearly equaling the pedicels. Pedicels 1 mm. long. Flowers scarcely 2 mm. long, trigonal in bud. Lateral sepals 2 mm. long, united to about the middle forming

an orbicular bilobed lamina which is 2 mm. wide across the middle, margin glandulose-ciliate; lobes triangular, acute, smooth on their opposed edges. Dorsal sepal 2 mm. long, 1.5 mm. wide, semielliptic or oblong, acute, 3-nerved, the nerves prominent on the outer surface and minutely glandular. Petals transversely elliptical, 2 mm. wide, hardly .5 mm. long, posterior portion about equal to the anterior portion, margin finely ciliolate. Labellum 3-lobed, 1 mm. long; lateral lobes narrowly transversely elliptical, appressed to the column, fleshy, ciliolate; middle lobe porrect, ciliolate. Column 1 mm. long, dilated upward; clinandrium entire. Pollinia two.

Not unlike *Lepanthes pristidis* Reichb. f. in habit, but with differently formed petals and labellum. Clearly distinguished from *L. fimbriata* Ames by the smaller flowers and abbreviated peduncles.

COSTA RICA, Cartago, La Murta, C. H. Lankester 349. Under side of leaves dark green stained with maroon, upper surface ivy-green (Ridgway). Sepals semitransparent, greenish, petals bilobed, orange, edged anteriorly with rhodomine-purple (Ridgway). Labellum of the same color, concealing the column. 5500 feet altitude. (TYPE in Herb. Kew.): Alto de Ochomogo, Tonduz (Herb. Instit. physico-geogr. nat. costaricensis No. 10387<sup>1</sup>), December 1896. 1550 meters altitude. (In U. S. Nat. Herb. No. 815046, mingled with the type of *Lepanthes fimbriata* Ames.)

***Lepanthes tridens* Ames sp. nov.** Radices fibratae, graciles. Caules secundarii graciles, cespitosi, erecti vel ascendentes, vaginis tubulatis obtecti, monophylli. Vaginae stramineae, plus minusve decem, minute glandulosae, inter se satis distantes, apice in laminam lanceolatam acutam marginatam dilatatae. Folium anguste lanceolatum, elongatum, apice longe tridentatum, in sicco purpurascens. Pedunculi quam folium multo breviores. Racemus abbreviatus, usque ad octoflorus. Pedicelli distichi. Flores parvi, succedanei. Sepala lateralia usque ad medium cohaerentia, margine ciliato-glandulosa, ovata, acuminata, binervia, laminam late ovatam bilobatam formantia, in textura valde mem-



## CENTRAL AMERICAN ORCHIDS

branacea. Sepalum dorsale late deltoideo-ovatum, usque ad apicem attenuatum, acutum, trinervium. Petala bilobata, lobo superiore elliptico obtuso, lobo anteriore triangulari-falcato subacuto incurvo. Labellum trilobatum, incrassatum; lobis lateralibus late unguiculatis, anguste ellipticis, utrinque obtusis; lobo medio abbreviato triangulo-apiculato, margine glanduloso. Discus glaber. Columna usque ad apicem dilatata, apice bilobata. Pollinia duo, anguste pyriformia.

Epiphytic herb with slender fibrous roots. Secondary stems 3-5 cm. long, slender, concealed by about ten elongated closely appressed cylindrical sheaths which are inconspicuously muriculate; monophyllous. Sheaths about 5 mm. long, dilated at the tip into a lanceolate marginate lamina which is minutely muriculate. Leaf up to 4.5 cm. long, 4.5 mm. wide below the middle, narrowly lanceolate, acuminate, tridentate at the tip, the middle tooth exceeding 1 mm. in length, the lateral ones a little shorter, purplish suffused with green in dried specimens. Peduncles fasciculate, shorter than the leaf, with the raceme about 11 mm. long, slender. Raceme flexuose, about 5 mm. long. Pedicels persistent, distichous. Flowers opening in succession. Lateral sepals 3.5 mm. long, united to about the middle to form a broadly ovate bilobed lamina which is 4 mm. wide where it joins the dorsal sepal, outer margins glandular-ciliate, inner margins glabrous; free portion of each sepal triangular, acute, 1.5 mm. wide at the point of union, 1 mm. long, the tips incurved, convergent. Dorsal sepal 3.5 mm. long, 4 mm. wide, deltoid-ovate, acuminate, subacute, 3-nerved, like the lateral sepals hyaline and membranaceous. Petals 2.5 mm. wide, hardly 1 mm. long from the point of insertion to the tip, transversely bilobed, with the posterior lobe of one petal overlapping the posterior lobe of the other behind the column; anterior lobe much narrower than the posterior one, triangular-falcate, subobtusely, the tip incurved. Labellum 3-lobed; lateral lobes unguiculate, elliptical, about 1 mm. long; middle lobe triangular-apiculate, porrect, equaling the lateral lobes, glandular. Column about 1 mm. long, dilated upward, bilobed posteriorly at the summit. Pollinia two, narrowly pyriform.

Plant similar to *Lepanthes inaequalis* Schltr., but dissimilar to it in the long acuminate leaves and overlapping petals. The conspicuously tridentate leaves are characteristic, and in this peculiarity it also resembles *L. inaequalis* Schltr.

COSTA RICA, Cartago, road to La Estrella, C. H. Lankester & Alfredo Sancho 432, February 9, 1923. Stem and bracts dull straw-color, leaves dull, velvety, horn-green, trifid at the apex. Sepals yellowish, hyaline, other segments pruinose orange-purple. 1700 meters altitude. (TYPE in Herb. Ames No. 23747.)

***Lepanthes Sanchoii* Ames sp. nov.** Herba epiphytica. Radices fibratae. Caules secundarii erecti vel ascendentes, vaginis dense muricatis vestiti, monophylli. Vaginae apice dilatatae, marginatae. Folium ellipticum, coriaceum, apice bidentatum apiculo interjecto. Pedunculi graciles, fasciculati. Racemus distichiflorus, flexuosus. Pedicelli oblique ascendentes. Bracteae inflorescentiae glandulosae. Sepala lateralibus longe triangularia, supra sparse glandulosa, acuta vel subobtusata, margine conspicue glandulosa. Sepalum dorsale prope basim oblongum, longe acuminatum, in caudam filiformem productum, margine glandulosum, trinervium, nervis prominentibus, extus glandulosum. Petala transverse elongata, latiora quam longiora, vel transverse bilobata lobo posteriore oblongo-lanceolato, obtuso, lobo anteriore lineari-triangulari, subacuto. Labellum trilobatum; lobis lateralibus unguiculatis, subellipticis, glandulosus, utrinque obtusis, margine interiore carinatis; lobo medio lineari, parvo, inter lobos laterales, porrecto, dense glanduloso. Columna gracilis, apice crasse fimbriata vel laciniata, laciniis valde inaequalibus.

Epiphytic herb with slenderly fibrous roots. Secondary stems 3-6 cm. long, concealed by from six to eleven elongated muricate closely appressed sheaths, monophyllous. Sheaths about 6 mm. long, dilated at the apex, the expanded rim marginate and muricate. Leaf about 2.7 cm. long, 6 mm. wide, elliptical, marginate, bidentate-apiculate at the apex, contracted below into an abbreviated conduplicate base. Peduncles fasciculate, with the raceme up

# ERRATUM

## Schedulae Orchidiana No. 4

On page 35, under *Epidendrum alanjense* Ames, *Encyclia Powellii Schltr.* should read *Encyclia Hunteriana Schltr.*

# CENTRAL AMERICAN ORCHIDS

to 3.5 cm. long. Raceme up to 1.5 cm. long, flexuose. Flowers seven or more, 2 mm. apart on obliquely ascending rigid pedicels, usually only one flower open at a time. Bracts glandulose. Lateral sepals 1.4 cm. long, about 2 mm. wide near the base, oblong-triangular, acute, sparsely glandulose on the upper surface to about the middle, densely glandular-ciliate on the margin, lightly carinate near the outer margin. Dorsal sepal 1.4 cm. long, about 4 mm. wide near the base, coherent with the lateral sepals, more or less oblong below the middle, from below the middle more or less clongated, triangular, abruptly contracted above to form a slender caudate tip, margin glandulose, prominently 3-nerved on the outer surface, the nerves glandulose. Petals transversely elongated, 4 mm. wide, hardly 1 mm. long, posterior portion oblong-lanceolate, obtuse, the anterior portion linear-triangular. Labellum 3-lobed, about 1.5 mm. long; lateral lobes subelliptical-dolabriform, extended posteriorly into blunt triangular auricles, in front more or less oblong, minutely ciliate on the margin, longitudinally carinate near the inner margin on the upper surface; mid-lobe about .5 mm. long, linear, about equaling the anterior portion of the lateral lobes, porrect, densely glandular, somewhat bulbous at the apex. Column slender, coarsely and unequally fringed at the apex.

In habit similar to *Lepanthes horrida* Reichb. f., but with a very different labellum and petals.

COSTA RICA, Road to La Estrella, C. H. Lankester & Alfredo Sancho 441, February 9, 1923. Sepals acajou-red or jasper-red (Ridgway) on inner surface. Dorsal sepal 3-keeled, the keels hispid, bordered on either side with a stripe of red, otherwise hyaline, yellowish green. 1700 meters altitude. (TYPE in Herb. Ames No. 23162.)

***Epidendrum alanjense*** Ames Sched. Orch. 1 (1922) 13.

*Encyclia Powellii* Schltr. in Fedde Repert. Beihefte 17 (1922) 46.

I have examined the type number of *Encyclia Powellii* Schltr. without being able to detect specific characters to separate it from *Epidendrum alanjense*.



**Epidendrum amandum** Ames *sp. nov.* Herba epiphytica. Radices validae, albae. Pseudobulbi uni-vel bifoliati, pyriformes. Folia ligulata, coriacea, acuta, ascendente. Pedunculus folia subaequans, pauciflorus. Bracteae inflorescentiae triangulares, acutae, abbreviatae. Pedicellus cum ovario glaber. Sepala lateralia anguste oblongo-elliptica, apice leviter inerassata. Sepalum dorsale sub-simile. Petala spathulata, obtusa. Labellum trilobatum; lobis lateralibus oblongis, obtusis; lobo medio suborbiculiari, obtuso. Discus infra apicem columnae callo excavato ornatus. Columna valida, utrinque ala oblonga inflexa ornata.

Roots coarse, whitish, spreading. Pseudobulbs caespitose, pyriform, rugose, up to 2 cm. long, with one or two leaves at the summit, when immature concealed by ample sheaths which soon break down into spreading fibres. Leaves 4-15 cm. long, about 1 cm. wide, ligulate, coriaceous, tapering abruptly at each end, acute, with a prominent mid-nerve. Peduncle with the raceme 8-14 cm. long, equaling the leaves, provided with about four closely appressed sheathing acute scarious bracts. Raceme 2-4-flowered, up to 6 cm. long. Flowers 1.5-2 cm. apart on the smooth rachis. Bracts of the raceme about 3 mm. long more or less, sheathing, scarious, triangular, acute. Pedicel with the ovary 1.5-2 cm. long, smooth. Flowers more or less olive-green. Lateral sepals 11 mm. long, 4 mm. wide, narrowly oblong-elliptic, subacute, slightly thickened beneath the tip. Dorsal sepal 11 mm. long, 3 mm. wide, dilated at the middle, tapering gradually toward the ends, obtuse. Petals 11 mm. long, nearly 4 mm. wide above the middle, spatulate subobtuse, or oblanceolate. Labellum 3-lobed, almost entirely free from the column, 11 mm. long; lateral lobes appressed to the sides of the column, 5 mm. long, 2 mm. wide, oblong, obtuse, separated from the middle lobe by a short almost obsolete isthmus; middle lobe 6 mm. long, 7 mm. wide, suborbicular, obtuse. Disc much thickened between the lateral lobes, with an excavated callus which terminates in three prominent nerves that extend beyond the middle of the middle lobe. Column about 7 mm. long, with an inflexed short oblong obtuse wing on each side in front.

A near ally of *Epidendrum chloroleucum* Hook., from which it differs conspicuously in the suborbicular obtuse middle lobe of the labellum. In dried specimens the middle lobe is provided with one or more purplish stripes.

PANAMA, Foothills east of Panama, C. W. Powell 271. Flowers in January and February. Sea level. (TYPE in Hrb. Ames No. 23749.)

***Epidendrum crescentilobum* Ames sp. nov.** Caules caespitosi, elongati, foliosi, vaginis foliorum obtecti. Folia subcoriacea, oblongo-lanceolata, subobtusata vel acuta, in sicco nervosa. Racemus laxiflorus, cylindraceus. Bractee inflorescentiae triangulares, acutae. Pedicelli graciles. Flores roseo-purpurei. Sepala lateralalia oblonga, usque ad basim leviter attenuata, acuta, apice incrassata. Sepalum dorsale simile. Petala spathulata, obscure apiculata. Labellum trilobatum; lobis lateralibus oblongis, obtusis, divaricatis; lobo medio subcrescentiformi, antice retuso-apiculato; isthmus labelli abbreviatus, quadratus. Callus in disco inter lobos laterales. Columna crassiuscula, apice plus minusve bilobata, lobis denticulatis.

Plants 3 dm. high, more or less. Stems about 2 mm. thick, caespitose, leafy, concealed by the closely appressed cylindrical warty bases of the leaves, terminating in a cylindrical raceme of rose-purple flowers. Leaves subcoriaceous, about 5 cm. long, 1 cm. wide near the base, oblong-lanceolate, acute or subobtusate, about 1 cm. apart, the lower ones soon deciduous. Raceme 7-8 cm. long, 4 cm. in diameter, bearing from ten to twenty or more flowers, the rachis more or less verruculose or muricate. Bracts of the inflorescence 3-5 mm. long, strongly concave, triangular, acute, much shorter than the slender pedicels, rigid. Pedicels with the ovary up to 1.5 cm. long, smooth. Lateral sepals 6-8 mm. long, up to 3 mm. wide, oblong, acute, gradually narrowed toward the base, thickened at the apex. Dorsal sepal similar. Petals 6-8 mm. long, 3 mm. wide near the obscurely apiculate apex, spatulate from a very narrow base. Labellum adnate to the column, including the adnate portion 8 mm. long, conspicuously 3-lobed, with the terminal lobe

creiscentiform and retuse-apiculate in front, with a spread of 6 mm., about 1 mm. wide; lateral lobes divaricate, 3 mm. long, up to 2 mm. wide, oblong, obtuse, together equaling the spread of the terminal lobe; isthmus of the labellum abbreviated, hardly 1 mm. long, 1.5 mm. wide. Disc of the labellum with a sulcate callus between the lateral lobes and a thickened ridge through the middle. Column 6-7 mm. long, bilobed at the summit, with the lobes minutely denticulate.

The nearest affinity of this species appears to be *Epidendrum pansamalae* Schltr., which has larger flowers and a very different labellum and column.

COSTA RICA, Cascajal, C. H. Lankester 60. Flowers rose-purple, fragrant. 5500 feet altitude. (TYPE in Herb. Kew.); Lankester K359. Flowers rose. 5500 feet altitude. (Herb. Kew.); Lankester K367. Flowers rose. 6000 feet altitude. (Herb. Kew.)

***Epidendrum cristobalense* Ames sp. nov.** Caules elongati, foliosi. Folia ligulata, usque ad apicem attenuata, valde coriacea, acuta, basi vaginantia. Pedunculus valde elongatus, in racemum multiflorum productus. Bracteeae pedunculi arcte vaginantes, complanatae, imbricatae, acutae, elongatae. Bracteeae inflorescentiae lineari-triangulares, acutae. Flores carnosii, inter se distantes. Sepala lateraliter deflexa, oblongo-elliptica, obtusa, valde incrassata. Sepalum dorsale simile, concavum. Petala spathulata, valde carinosa, carinata. Labellum cum columna cohaerens, cordatum, valde carnosum, subconduplicatum, carinatum. Columna brevis, carinosa.

Stems elongated, leafy. Leaves coriaceous, up to 19 cm. long, 8 mm. or more wide, narrowed toward the apex, acute. Peduncle sheathed by several elongated complanate imbricating bracts, which are from 5 to 12 cm. long, and acute at the tip. Raceme 5 dm. or more long, 1.5 cm. in diameter, bearing as many as fifty pinkish flowers, arching or drooping. Flowers 1 cm., more or less, apart. Floral bracts rigid, linear-triangular, acute, about 5 mm. long. Pedicels with the ovary about 5 mm. long. Lateral sepals

9 mm. long, 5 mm. wide, somewhat spreading, extraordinarily fleshy, oblong-elliptical, obtuse. Dorsal sepal similar, strongly concave. Petals 9 mm. long, 2 mm. wide above the middle, spatulate, obtuse, very fleshy, thickly carinate along the middle on the outer surface. Labellum adherent to the column, free portion 5 mm. long, broadly cordate, obtuse, extraordinarily fleshy, more or less conduplicate. Column about 4 mm. long, very stout, with a hamate wing or tooth on each side at the summit.

The nearest affinity of this species is *Epidendrum laucheanum* Rolfe, from which it differs in having larger, fleshier flowers, different petals, and much more rigid leaves.

COSTA RICA, San Cristobal, C. H. Lankester & Alfredo Sancho 381, January 12, 1923. A common species at medium elevations. Flower about Verona-brown (Ridgway), under side of the lip greenish; in sunny stations the flowers are reddish ochre. 5000-8000 feet altitude. (TYPE in Herb. Ames No. 23728); Cascajal, C. H. Lankester K365, February 14, 1920. (Herb. Kew.)

***Epidendrum equitantifolium* Ames nom. nov.**

*Epidendrum equitans* Lindl. in Bot. Reg. (1838) Misc. 44, non Ruiz & Pav. (1798).

There are two species which have passed under the name *Epidendrum equitans*. The older one was described by Ruiz and Pavon from Peruvian material. For the Central American species, now known to range from Mexico to Panama, I propose the new name *Epidendrum equitantifolium*.

***Epidendrum estrellense* Ames sp. nov.** Caules elongati, radicanes, ramosi, foliosi. Folia articulata, ligulata, utrinque attenuata, acuminata, acuta vel obtusa. Vaginae foliorum arcte appressae, complanatae. Inflorescentia terminalis, floribus distichis in racemum abbreviatum dispositis. Bracteae infra inflorescentiam imbricatae, valde complanatae. Flores flavi, bracteas racemi vix excedentes. Sepala lateraliter anguste elliptico-oblonga. Sepalum dorsale simile. Petala spathulata, obtusa. Labellum col-



## CENTRAL AMERICAN ORCHIDS

umnae adnatum, simplex, suborbiculare, basi cordatum. Columna brevis.

Stems about 4 mm. in diameter, branched, rooting. Leaves distichous, 8–12 cm. long, up to 2.5 cm. wide, narrowly elliptic-oblong, rounded at base, gradually narrowed toward the acute or obtuse tip, rigid, jointed to rigid closely appressed complanate sheaths, the leaves 1–2.5 cm. apart. Inflorescence terminal. Flowers light viridine-yellow (Ridgway) when fresh, distichous in short racemes, the subtending bracts exceeding the pedicellate ovary. Raceme 2.5 cm. long, about 2 cm. across, few-flowered, subtended by seven or more closely imbricating complanate sheathing bracts which are 11–16 mm. long. Floral bracts about 12 mm. long, glumaceous. Pedicel with the ovary about 7 mm. long, wholly concealed by the subtending floral bract. Lateral sepals 1 cm. long, 3 mm. wide, narrowly elliptic-oblong, terminating in a blunt thickened tip, the three central nerves much thickened in dried specimens. Dorsal sepal about 1 cm. long, oblong, obtuse. Petals about 1 cm. long, 4 mm. wide above the middle, spatulate, obtuse, the nerves thickened. Labellum adnate to the column, including the adnate base 1 cm. long, up to 8 mm. wide, suborbicular-cordate, obtuse. Disc tricarinate, the middle keel extending to the tip of the labellum. Column 3 mm. long, with the clinandrium entire.

Undoubtedly a close ally of *Epidendrum phyllocharis* Reichb. f., from which it differs in being ecallose at the base of the labellum and in having the pedicellate ovary of each flower entirely concealed by an ample imbricating bract.

COSTA RICA, Cartago, La Estrella, C. H. Lankester & Alfredo Sancho 379, January 1923. (TYPE in Herb. Ames No. 23724.)

***Epidendrum exile*** Ames sp. nov. Radices fibratae. Caules ramosi, foliosi. Flores singuli. Bractea floris pedicellum cum ovario excedens, valde complanata, spathacea. Sepala lateralalia anguste lanceolata, longe acuminata, nervosa, subtus prope apicem carinata. Sepalum dorsale simile. Petala anguste lanceolata, longe acuminata, ccarinata. Labellum triangulari-lanceolatum, longe acumina-

tum, acutum, ecallosum, nervo medio prope apicem laminae prominenti. Columna carnosae, labello adnata.

Plant about 18 cm. tall, branched, the branches terminated by a solitary yellowish flower, leafy. Branches 4-6 cm. long, compressed, concealed by the sheathing bases of the leaves. Leaves 2-5 cm. long, up to 8 mm. wide, ligulate-oblong, bilobed at the tip, the lobes rounded and obtuse, coriaceous, distichous. Peduncles terminal on the branches, about 1 cm. long, concealed by the conduplicate base of the uppermost leaf, one-flowered. Pedicel with the ovary about 7 mm. long, concealed by a spathaceous scarious glumaceous bract, somewhat roughened or minutely verruculose. Bract 9-12 mm. long. Lateral sepals apparently spreading, 1.7 cm. long, about 3 mm. wide near the base, narrowly lanceolate, acuminate, acute, conspicuously carinate beneath near the apex, prominently nerved. Dorsal sepal similar. Petals about 1.5 cm. long, 3 mm. wide below the middle, narrowly lanceolate, acuminate, acute, more or less fleshy with thickened nerves. Labellum 1.5 cm. long, similar in texture to the sepals and petals, adnate to the column, the free portion about 6 mm. wide across the base, triangular-lanceolate in outline, long and slenderly acuminate, the apical portion with strongly conduplicate margins. Disc ecallose in front of the column, the mid-nerve prominent above the middle of the lamina. Column about 5 mm. long, fleshy.

Undoubtedly a close ally of *Epidendrum singuliflorum* Schltr., from which it differs in the more acuminate perianth segments of the larger flowers, in the differently shaped long-acuminate acute labellum, and in the larger leaves. From *E. Boissierianum* Schltr. it differs in having larger flowers, a very different labellum, and narrower leaves. In the type specimen there is no distinct callus at the base of the labellum in front of the adnate column, the only conspicuous thickening being a longitudinal one from the middle caused by the protuberant or raised mid-nerve.

COSTA RICA, Cartago, La Estrella, C. H. Lankester & Alfredo Sancho 430, January 9, 1923. Common in open pasture fences, flowers pale yellowish green. (TYPE in Herb. Ames No. 23156.)

***Epidendrum gravidum* Lindl.** in Journ. Hort. Soc. 4 (1849) 114.

*Encyclia gravis* Schltr. in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 472.

Lindley's specimen only consists of an inflorescence which is about 18 cm. long. It appears to have been 7-flowered in a loose raceme. The perianth appears never to have opened. Sepals about 12 mm. long, the laterals about 3 mm. wide, heavily carinate at the tip. Petals 1 cm. long, about 3 mm. wide, narrowly elliptic-oblong, subacute from a broad base. Labellum about 1 cm. long, 3-lobed; lateral lobes 6 mm. long, 3 mm. wide at base, narrowed gradually to an obtuse tip; middle lobe including the subquadrate isthmus 7 mm. long, about 4.5 mm. wide across the middle, ovate-lanceolate, heavily nerved on the upper surface (the nerves prominent in dried material). Disc heavily 5-nerved, the alternate nerves prominent on the isthmus and coalescent—at the base of the middle lobe—with the mid-nerve which extends to the tip of the lip. Column 6 mm. long, constricted at the middle, obscurely 3-lobed at the summit, the lobes rounded; in front below the summit there is a short obtuse inflexed membranous wing or auricle on each side. The capsules are fusiform, bluntly muriculate and with the pedicel about 4 cm. long.

This species was described from Mexican material, but so inadequately characterized that it has remained in doubt. In my herbarium there is a specimen collected by Purpus (No. 62) in Mexico that Schlechter communicated to me under the name *Epidendrum gravidum*. It differs in several details from Lindley's type preserved in Kew, but is undoubtedly conspecific with it.

The foregoing description has been prepared from Lindley's type, a flower from the unique specimen having been submitted for study by Captain Arthur W. Hill, Director of the Royal Gardens, Kew. The type was collected by Hartweg in February 1837. It was said to have been collected at Xapatam, Mexico. It is quite possible that Xapatam is an erroneous spelling of Zacualpan.

## CENTRAL AMERICAN ORCHIDS

In the specimen collected by Purpus the inflorescence is about 20 cm. long, with eight flowers in a loose raceme. Raceme 13 cm. long. The perianth, muriculate capsule, and slender pedicel taken together are about 4 cm. long. Pseudobulbs about 4 cm. long, trifoliate. Leaves rigid, coriaceous, up to 18 cm. long, about 1.5 cm. wide.

*Epidendrum gravidum* appears to be a cleistogamous species.

MEXICO, Xapatam, *Hartweg*, February 1837. (TYPE in Herb. Kew. (Lindley Coll.)): Federal District, Zacualpan, C. A. *Purpus* 62, 1907.

PLATE 2. 1, raceme drawn from a photograph of Lindley's type, three-fourths natural size. 2, column drawn from a flower of Lindley's type ( $\times 4$ ). 3, flower, the perianth segments spread out, drawn from the type ( $\times 1\frac{1}{2}$ ). 4, plant drawn from a specimen collected by C. A. *Purpus* no. 62, three-fourths natural size.

***Epidendrum imatophyllum* Lindl. Gen. & Sp. Orch. (1831) 106.**

*Epidendrum palpigerum* *Reichb. f.* in Gard. Chron. ser. 2, 12 (1879) 40. *Epidendrum lorifolium* *Schltr.* in Fedde Repert. Beihefte 17 (1922) 35.

*Epidendrum imatophyllum* Lindl., as I understand it, is a widespread species in tropical America. It ranges from Mexico to Brazil. From my field observations it would seem to grow in the nests of ants on trees and to flower throughout its Central American range from February to May.

Dr. Rudolf Schlechter, in his recent paper devoted to C. W. Powell's Panama orchids, proposed a new species under the name *Epidendrum lorifolium*. He would have us believe that this represents a Central American plant which has passed as *Epidendrum imatophyllum* Lindl. In his notes he implies that it is different in the structure of the labellum from Schomburgk's Guiana plant from which Lindley prepared the description of *E. imatophyllum*.

I have examined herbarium material of *E. lorifolium* submitted to me by Mr. Powell; I have studied living plants in Mr. Powell's garden in Balboa. This material is



specifically inseparable from the species I have observed in Mexico, Honduras, Costa Rica, and Panama that is usually referred to *Epidendrum imatophyllum* Lindl. In habit and floral structure it resembles the Guiana plant in Lindley's herbarium so closely that to recognize it as a new species seems unwise. The only differences between the labellum of *E. lorifolium* and *E. imatophyllum* that I have been able to detect are such as normally occur in species which are characterized by dentate, laciniate or fimbriate perianth segments.

The labellum of *E. imatophyllum* both in Central American and Guiana material exhibits a wide range of variation. This is very true of the terminal lobe which is sometimes entire, but not infrequently more or less dentate. In Lindley's sketch the tip of the labellum is drawn as if it were retuse, but the original description calls for an apiculate tip.

Lindley described and drew the petals of *E. imatophyllum* as laciniate on the margin. In my studies I have found a wide range of variation in the margin of the petals. Recently, in Yucatan, I found a large clump of the species in which the flowers exhibited entire, crenate and dentate petals. Consequently I regard this character as of trivial importance in any attempt to recognize significant differences in *E. imatophyllum*.

In 1879 Reichenbach published a new Mexican plant under the name *Epidendrum palpigerum*. Although this plant has remained obscure it is pretty well clarified by a flower and sketches in Reichenbach's herbarium. My studies have convinced me that it is conspecific with *E. imatophyllum*. If, however, it should prove that a new name is needed for the Central American species, then *E. palpigerum* Reichb. f. would take precedence over *E. lorifolium* Schltr.

To bring out clearly the position I have taken with regard to *E. lorifolium*, I have had prepared the series of drawings reproduced below. These drawings do not indicate the extremes of variation, but simply exhibit Lindley's semi-diagrammatic sketch of a flower of *E. imatophyllum*, a

camera-lucida drawing of a flower from Powell's specimen of *E. lorifolium* and Reichenbach's sketch of a flower of *E. palpigerum*.

FIGURE. 1, *Epidendrum imatophyllum* Lindl. drawn with the aid of camera-lucida from Lindley's sketch. (Apiculate tip of labellum not shown.) 2, *E. lorifolium* Schltr. drawn with the aid of the camera-lucida from a flower furnished by C. W. Powell. 3, *E. palpigerum* Reichb. f. drawn with the aid of the camera-lucida from Reichenbach's sketch of the type flower. Drawings by Blanche Ames.



***Epidendrum Lankesteri* Ames sp. nov.** Caules elongati. Folia anguste lanceolata, acuminata, acuta, utrinque attenuata, basi vaginantia. Pedunculus valde bialatus, complanatus. Bractea inflorescentiam subtendens complanata, nervosa. Inflorescentia breviter ramosa. Bractae inflorescentiae glumaceae. Pedicellus cum ovario gracilis, glaber. Sepala spathulata, obtusa, usque ad basim angustata, coriacea. Petala filiformia, uninervia. Labellum integrum; lamina subrotundata, obtusa, margine obscure lobatum. Discus prope apicem columnae bicallosus, callis erectis valde complanatis. Columna infra apicem valde attenuata.

Stems elongated, slender, probably leafy, but in the fragment which constitutes the only available material there is a single leaf. Leaf about 15 cm. long, 1.8 cm. wide near the middle, narrowly lanceolate, acuminate, acute, gradually narrowed toward the base where it sheaths the stem. Pe-

duncle with the shortly branched inflorescence about 15 cm. long, conspicuously two-winged, below the inflorescence provided with a large sheathing conduplicate bract which is 3 cm. long. Inflorescence branched, with the branches about 2 cm. long. Bracts of the inflorescence 5-9 mm. long, conduplicate, subimbricated, glumaceous when dry, many-nerved, some of them apparently sterile. Pedicel with the ovary about 12 mm. long, slender, smooth. Lateral sepals 13 mm. long, 2.5 mm. wide near the middle, fleshy, nervose, asymmetrically spatulate from a narrow base, obtuse. Dorsal sepal 13 mm. long, about 3 mm. wide above the middle, spatulate, obtuse, fleshy. Petals 12 mm. long, hardly 1 mm. wide, linear, 1-nerved, spreading. Labellum adherent for more than half its length to the column, free portion about 6 mm. long, 4 mm. wide near the base, sub-rotund, obscurely lobed near the base, in dried specimens exhibiting a central ridge which extends nearly to the tip, bicallose in front of the summit of the column, the calli erect, complanate, and rounded. Column 11 mm. long, dilated above, constricted below the stigma into a slender base; androclinium obscurely lobed. Pollinia four.

The conspicuously two-winged peduncle and the subimbricating glumaceous bracts of the inflorescence separate this species clearly from its nearest allies. Unfortunately the only specimen obtained is fragmentary. It seems to represent the upper part of a leafy stem. The flower suggests affinity with *Epidendrum floribundum* H. B. K., from which it is distinguishable by the simple labellum, contracted inflorescence, and large glumaceous bracts.

COSTA RICA, Cascajal, C. H. Lankester 63. Sepals greenish, petals white. 5500 feet altitude. (TYPE in Herb. Kew.)

PLATE 3. Drawn from the type, three-fourths life size. 1, habit. 2, flower ( $\times 1 \frac{1}{2}$ ). 3, labellum and column ( $\times 3$ ). 4, labellum ( $\times 3$ ).

***Epidendrum peraltense* Ames sp. nov.** Radices valde carnosae, albae. Pseudobulbi magni, pyriformes, triphylli. Folia ligulata, coriacea, apicem racemi subaequantia.

*Racemus clongatus*, breviter ramosus, multiflorus. Bractee inflorescentiae rigidae, abbreviatae, subacutae, concaviusculae. Pedicellus cum ovario glaber. Flores plus minusve in ramis racemi congesti. Sepala lateralialia ligulata, utrinque angustata, apice incrassata, breviter carinata. Sepalum dorsale simile. Petala anguste oblanceolata, acuta. Labellum trilobatum, usque ad basim liberum; lobis lateralibus oblongis, obtusis, purpurco-tinctis, nervis purpureis; lobo medio orbiculari-ovato, acuto. Discus callosus, callo sulcato in nervis tribus incrassatis producto. Columna carnosa, utrinque prope apicem alata.

Roots coarse, whitish. Pseudobulbs about 5 cm. long, 3 cm. in diameter, globose-pyriform, trifoliate. Leaves 18–30 cm. or more long, 2–2.5 cm. wide, ligulate, very coriaceous, narrowed gradually to an obtuse tip. Peduncle with the inflorescence about 40 cm. long, the upper two-thirds floriferous, the flowers borne on alternating abbreviated branches which are 1.5–3 cm. long, each branch bearing from three to seven flowers. Bracts of the inflorescence about 1.5 mm. long, rigid, concave, acute. Pedicel with the ovary 1.5 cm. long, smooth. Lateral sepals 11 mm. long, 3 mm. wide, ligulate, narrowed toward both ends, acute, shortly carinate-thickened beneath the tip. Dorsal sepal similar. Petals about 11 mm. long, 2.5 mm. wide above the middle, narrowly oblanceolate, acute. Labellum free from the column to the base, about 1 cm. long, 3-lobed; lateral lobes appressed to the column, oblong, obtuse, 5 mm. long, 2 mm. wide, rounded at the tip, stained and striped with rose-purple; middle lobe including the short isthmus 8 mm. long, 5 mm. wide, orbicular-ovate, acute. Disc provided with a fleshy excavated or sulcate callosus which extends upon the middle lobe where it terminates in three raised nerves. Column 5 mm. long, provided in front, — on each side, — with a short obtuse wing as in *E. diurnum* (Jacq.) Reichb. f.

Related to *Epidendrum ramonense* Reichb. f., from which it differs conspicuously in the denser, shortly branched inflorescence. The flowers appear to have been greenish yellow with purple markings on the lip.



COSTA RICA, Peralta, C. H. *Lankester & Alfredo Sancho* 378. 1500 feet altitude. (TYPE in Herb. Ames No. 23726.)

***Epidendrum Porpax*** Reichb. f. in Bonpl. 3 (1855) 220, non Reichb. f. in Flora 48 (1865) 278.

This species is a native of Panama, Costa Rica, and Nicaragua.

Unfortunately Reichenbach described two distinct species under the name *Epidendrum Porpax*. One of these is a native of Cuba, the other one was described from Nicaraguan material. By an error in bibliographical citation, Schlechter, in his enumeration of C. W. Powell's Panama orchids, indicates that the Cuban *E. Porpax* is a native of Central America. The same error occurs in Schlechter's earlier paper entitled "Kritische Aufzählung der bisher aus Zentral-Amerika bekanntgewordenen Orchidaceen," published as a supplement to the Botanischen Centralblatt in 1918.

For the Cuban species (*cf. infra*) I have proposed the new combination *Epidendrum vestitum*.

***Epidendrum Sanchoii*** Ames *sp. nov.* Herba epiphytica, valde ramosa. Caulis primarius validus, elongatus; caules secundarii abbreviati, foliosi. Folia linearia, coriacea, ad vaginas verruculosas articulata, obtusa. Racemi pauciflori, terminales. Rachis valde fractiflexa. Bractee inflorescentiae pedicellum cum ovario aequantes, scariosae. Flores virides. Sepala lateralibus oblongo-lanceolata, acuta, apice conduplicata, carinata. Sepalum dorsale simile. Petala linearia, acuta. Labellum simplex, triangulare, subacutum, apice incrassatum, ecallosum, nervis incrassatis. Columna labello adnata, ecornuta.

Epiphytic herb up to 30 cm. tall, with thickened primary stem, much branched, fruticose. Secondary branches up to 2 cm. long, concealed by the verruculose closely appressed sheaths of the leaves, somewhat complanate. Leaves 1.5 cm. long, about 2 mm. wide, linear, obtuse or subtruncate at the apex, coriaceous, distichous. Racemes terminal on the branches, usually 3-flowered, about 1 cm. long, the smooth rachis flexuose. Bracts of the

inflorescence about 3.5 mm. long, concave, acute, equaling the ovary, scarious in dried specimens. Lateral sepals about 5 mm. long, 2 mm. wide, oblong, acuminate, acute, with the apex carinate-thickened, 5-nerved. Dorsal sepal 5 mm. long, about 2 mm. wide, rounded toward the base, oblong, acuminate, acute, 5-nerved. Petals 4.5 mm. long, .75 mm. wide, linear, acute, fleshy, 3-nerved. Labellum adnate to the column, the free portion about 4 mm. long, 2 mm. wide at the base, triangular with the basal angles rounded, apical third much thickened. Disc ecallose, veins thickened. Column 2 mm. long, fleshy, entire at the apex.

Allied to *Epidendrum ramosum* Jacq., from which it differs conspicuously in its more densely branching habit, and smaller leaves.

COSTA RICA, near Cartago, C. H. Lankester & Alfredo Sancho 384. 6000 feet altitude. (TYPE in Herb. Ames No. 23158.)

***Epidendrum santaclarens*** Ames sp. nov. Caules rigidi, ramosi, foliosi. Folia disticha, rigida, ligulata, valde coriacea, nervo medio subtus prominenti. Racemus plus minusve sexflorus, terminalis. Flores virides, distichi, inter se distantes. Bracteae inflorescentiae elongatae, margine involuto, pedicellum obtegentes. Sepala lateralalia ligulata, usque ad apicem angustata, subacuta, rigida. Sepalum dorsale subsimile. Petala lineari-oblonga. Labellum a basi cordata in laminam lanceolatam productum. Discus callo excavato, acuto instructus; callus antice in lineam in-crassatam productus. Columna apice minute denticulata.

Stems about 4 mm. in diameter, branching, leafy, sparsely rooting above on the defoliated portions. Leaves 4–6.5 cm. long, up to 1.5 cm. wide, jointed to rigid closely appressed complanate sheaths, 5–20 mm. apart, distichous, the lamina rigidly coriaceous, ligulate, with the mid-nerve prominent. Peduncle floriferous nearly to the base, terminal, with the raceme 7–8 cm. long, about 2.5 cm. across, six to seven or more flowered, subtended by about two closely appressed obtuse bracts and by the much reduced uppermost leaf of the stem. Bracts of the inflorescence 2.5 cm.

long, the margins involute or overlapping, enclosing the pedicel and the lower portion of the ovary. Flowers greenish, 7–10 mm. apart. Pedicel with the ovary 2.5–3 cm. long. Lateral sepals 14 mm. long, 3.5 mm. wide at the base, ligulate, narrowed gradually to the subacute tip, fleshy, more or less rigid, hardly spreading. Dorsal sepal sub-similar. Petals 13 mm. long, about 1.5 mm. wide, linear-oblong, subacute, fleshy. Labellum adnate to the column, about 12 mm. long, cordate-lanceolate, subacute, margins more or less erect, the basal portion strongly concave, with prominent nerves. Disc near the apex of the column with an excavated or sulcate triangular callus formed by two converging keels, the acute apex produced into a thickened mid-nerve which extends to the tip of the labellum. Column stout, 6 mm. long, clinandrium minutely denticulate on the posterior margin.

A near ally of *Epidendrum imbricatum* Lindl., from which it is readily distinguished by the distant flowers and involute floral bracts.

COSTA RICA, Cartago, Santa Clara, C. H. Lankester & Alfredo Sancho 443. 6000–6500 feet altitude. (TYPE in Herb. Ames No. 23727.)

***Epidendrum trachycarpum* Lindl.** in Benth. Bot. Voy. Sulph. (1844) 172.

*Encyclia trachycarpa Schltr.* in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 474.

Pseudobulbs about 7 cm. long, about 2 cm. in diameter near the base, elongated, pyriform, with basal sheaths which soon break down into straggling fibres, trifoliate. Leaves 26 cm. or more long, up to 1 cm. wide, ligulate, acute. Peduncle slender, with the few-branched raceme 28–35 cm. long, about 7-flowered. Flowers up to 3.75 cm. across, fleshy, in dried specimens blackish, the petals margined with orange. Pedicellate ovary nearly 2 cm. long, scabridulous or verruculose. Lateral sepals 1.8 cm. long, 7 mm. wide near the middle, elliptic-oblong, acute, very fleshy, narrowed toward the base. Dorsal sepal similar. Petals 1.7 cm. long, about 5 mm. wide near the middle, spatulate, acute, fleshy,

7-nerved, the mid-nerve prominent in dried material. Labellum about 1.5 cm. long, 3-lobed; lateral lobes much shorter than the middle lobe, 3 mm. long on the inner margin, 2 mm. wide, lanceolate, obtuse; middle lobe including the isthmus 11 mm. long, about 8 mm. wide, rotundate, emarginate, heavily veined. Callus fleshy, very prominent (in dried specimens 2 mm. thick), shallowly excavated, oblong, extending beyond the base of the middle lobe, rounded in front, abruptly decurrent at the apex into three raised earinate nerves. Column 8 mm. long, very fleshy, produced on each side into a broad triangular acute wing, but not auriculate.

MEXICO, Manzanilla Bay, *Hinds*.

The prominent callus and large middle lobe, in combination with conspicuously smaller lateral lobes, give to the flowers of *Epidendrum trachycarpum* an aspect which is unusual in the genus. I only know this species through the material in Lindley's herbarium at Kew. For the opportunity to amplify Lindley's brief description I am indebted to Captain Arthur W. Hill, Director of the Royal Gardens, Kew, who kindly submitted a flower of the type for examination.

PLATE 3. 1, raceme drawn from a photograph of Lindley's type, three-fourths natural size. 2, pseudobulbs and leaves drawn from a photograph of Lindley's type, three-fourths natural size. 3, labellum and column drawn from a flower of Lindley's type ( $\times 1 \frac{1}{2}$ ). Drawn with the aid of the camera-lucida by Blanche Ames.

***Epidendrum vestitum* Ames nom. nov.**

*Epidendrum Porpax* Reichb. f. in Flora 48 (1865) 278, non Reiehb. f. in Bonpl. 3 (1855) 220.

Reichenbach described two species under the name *Epidendrum Porpax*, one from Niearagua in 1855 the other from Cuba in 1865. The Cuban species is without a valid name. The new name here proposed alludes to the ample sheaths which conceal the stems.

CUBA, *Wright* 3343.



**Ornithidium Lankesteri** Ames *sp. nov.* Herba epiphytica, valida, floribunda. Caules erecti vel ascendentes, foliosi. Folia disticha, ligulata, valde coriacea, apice obtuse et inaequaliter bilobata, nervo medio prominenti. Flores numerosi ex axillis vaginarum. Vaginae complanatae caulem obtegentes. Pedunculi elongati, graciles. Sepala lateralalia oblonga, acuta. Sepalum dorsale simile. Petala elliptico-oblonga, utrinque attenuata, acuta. Labellum trilobatum, callosum, carinis tribus prope basim, carnosum, petalis multo brevius; lobis lateralibus porrectis, obtusis; lobo medio lobos laterales multo excedenti, triangulari, apice incrassato subtriquetro. Callus in disco valde incrassatus usque ad basim lobi medii extensus, antice truncatus. Columna in pedem brevem producta, usque ad apicem leviter dilatata.

Epiphytic herb 60–90 cm. high, with numerous distichous leaves and many flowers from the axils of the leaf-sheaths. Stems about 1.4 cm. in diameter, somewhat complanate above. Leaves about 2 cm. apart, jointed to closely appressed sheaths, 7–12.5 cm. long, up to 1.5 cm. wide, narrowly oblong, obtusely and unequally bilobed at the tip, somewhat conduplicate at the base. Leaf-bases up to 1.3 cm. long, imbricating. Peduncles 5–6 cm. long, slender, with several closely appressed elongated bracts, apparently fasciculate. Bract subtending the pedicel 1 cm. or more long, conduplicate, embracing the base of the pedicel, ovate-lanceolate, acute, the apex extending beyond the base of the upper sepal and closely appressed. Lateral sepals about 1.6 cm. long, 4 mm. wide, oblong, acute. Dorsal sepal similar. Petals about 1.5 cm. long, 4 mm. wide, narrowly elliptic-oblong, acuminate, acute. Labellum fleshy, 7 mm. long, about 4 mm. wide when spread out between the tips of the lateral lobes; lateral lobes quadrate, rounded at the tip, 2 mm. wide; middle lobe much exceeding the laterals, 3 mm. long, 2 mm. wide near the base, 3-nerved, triangular, acute or obtuse, somewhat triquetrously thickened near the apex. Disc with three raised keels near the base of the labellum and with a dilated truncate median callus which extends to the base of the middle lobe. Column 6 mm. long, ex-

tended at the base into a short foot to the tip of which the labellum is rigidly attached. Pollinia four, cohering in pairs at the apex of an oblong caudicle.

Allied to *Ornithidium Biolleyi* Schltr. and *O. bracteatum* Schltr., from which it is very different in the structure of the floral segments.

COSTA RICA, San Cristobal, C. H. Lankester & Alfredo Sancho 421, January 12, 1923. Common on trees standing in the pastures on ridges or upper slopes, a delightful natural object. Lower leaves deciduous. Segments of the flower crystalline white, petals suffused centrally at base with pink. Labellum empire-yellow (Ridgway), basal two-thirds of column aster-purple (Ridgway), this color also tinting the lateral lobes of the labellum. Anther-cap white. 5500 feet altitude. (TYPE in Herb. Ames No. 23735.)

***Oncidium Lankesteri* Ames sp. nov.** Est planta habitu *O. suavis* Lindl. pseudobulbis et foliis minor (Lankester). Pseudobulbi et folia desiderantur. Inflorescentia decemramosa, rami sex ad septemflori, patentes vel leviter ascendentes. Bracteae ramos subtendentes permagnae, arcte appressae. Bracteae inflorescentiae flores subtendentes late triangulari-ovatae, scariosae, pedicellis multo breviores. Sepala lateralalia unguiculata, oblonga, undulata, valde carinata. Sepalum dorsale unguiculatum, oblongum, acutum, ecarinatum. Petala oblongo-elliptica, obtusa, vix unguiculata. Sepala petalaeque brunnea, marginibus lutea. Labellum panduratum; lobis lateralibus suborbicularibus; lobo medio obreniformi, emarginato, aurco, isthmo brunneo-maculato. Crista quinquelobata. Columna alis dolabriorum instructa.

Pseudobulbs and leaves as in *Oncidium suave* Lindl., but smaller. Inflorescence up to 9 dm. long, racemose-paniculate, the lateral branches up to ten, 14–19 cm. long, each branch 6–7-flowered, with the flowers 2.5–3 cm. apart. Bracts subtending the branches about 1.3 cm. long, scarious, breaking down into fibres, closely appressed. Bracts subtending the flowers about 5 mm. long, scarious, broadly triangular-ovate. Pedicels with the ovary 2–2.5 cm. long. Lateral

sepals up to 1.4 cm. long, 4 mm. wide, undulated, brown margined with yellow, unguiculate, oblong, obtuse, strongly carinate along the median nerve. Dorsal sepal 1.2 cm. long, about 5 mm. wide, unguiculate, oblong, acute, undulate, ecarinate, colored like the lateral sepals. Petals hardly unguiculate, oblong-elliptic, obtuse, 1.4 cm. long, 5 mm. wide, undulate. Labellum 1.4 cm. long, 1 cm. wide across the base, 1.3 cm. wide across the tip, pandurate, about 4 mm. wide near the middle; lateral lobes suborbicular, 2.5 mm. wide; middle lobe broadly obreniform or transversely elliptical, emarginate, 8 mm. long, bright yellow heavily marked with brown on the isthmus. Crest basal, 5-lobed, puberulous, four of the lobes in pairs, the fifth one terminal and trilobulate, acute, porrect. (In dried specimens each member of the basal pair of lobes of the crest has a thickened lobule on its upper surface, the members of the anterior pair are affixed to the disc of the labellum and confluent with the ventral side of the trilobulate terminal lobe which is fleshy at the base and produced in front into a rostrate porrect tip.) Column 5 mm. long, with dolabriform wings.

The nearest ally of this species is *Oncidium Suttonii* Batem., which has a different crest on the labellum, somewhat smaller flowers, and the branches of the paniculate raceme shorter. In the type specimen of *Oncidium Suttonii* the larger and more characteristic inflorescence has five flowers on each branch of the raceme. In *O. Lankesteri* there are usually six or seven flowers on each branch. While it is true that the number of flowers is variable, and not a reliable guide to specific difference, it serves, with the other characters described, to make differentiation possible.

COSTA RICA, Irazu Volcano, Slopes in valley of Reventado, C. H. Lankester & Alfredo Sancho 415. Repulsively aromatic after sundown. Sepals and petals brown margined with yellow. Labellum bright yellow. 6000 feet altitude. (TYPE in Herb. Ames Nos. 23729, 23730, and 23731); Cartago, C. H. Lankester K339. (Herb. Kew.)

**Chondrorrhyncha estrellensis** Ames sp. nov. Herba epiphytica, acaulis. Radices clongatae, glabrae, in sicco

albidae. Folia articulata, erecto-patentia, basi vaginis amplectentibus oblecta, anguste lineari-lanceolata vel oblongo-lanceolata, acuminata, acuta, basim versus sensim angustata. Inflorescentia ex axillis vaginarum, uniflora, pedunculo gracili paucivaginato. Ovarium valde triatatum. Sepala lateralia deflexa, valde curvata, anguste oblonga, utrinque angustata, acuta, in sicco valde nervosa. Sepalum dorsale simile. Petala sepalis latiora, late oblanceolata, obtusa, in sicco valde nervosa. Labellum antice obscure trilobatum, basi rotundatum, concavum, margine undulatum, in circuitu quadrato-ovatum, obtusum, callo plus minusve membranaceo apice bilobato ornatum. Callus utrinque bidentatus, apice bilobato libero. Columna elongata.

Epiphytic herb up to 23 cm. tall from the base to the tip of the longest leaf. Roots elongated, about 2 mm. thick, whitish, smooth, spreading. Leaf-bases equitant, 2–3.5 cm. long. Leaves articulated, up to 19 cm. long, 1.5–2.5 cm. wide near the middle, narrowly lanceolate, acuminate, acute, membranaceous, pliable, nervose when dry. Peduncles from the axils of the leaves, about 13 cm. long, few-bracted. Flower solitary. Pedicel with the ovary 2 cm. long. Ovary conspicuously 3-winged. Lateral sepals 2.7 cm. long, about 5 mm. wide, narrowly oblong, narrowed toward both ends, acute, deflexed, spreading. Dorsal sepal similar, erect. Petals 2.5 cm. long, 9–10 mm. wide near the middle, obtuse, broadly oblanceolate, erect. Labellum 2.5–3 cm. long, about 2 cm. wide when spread out, broadly ovate in outline, obscurely 3-lobed in front with the margin undulate, strongly concave at base. Disc smooth, with a partly free membranaceous plate or callus which is deeply bilobed at the tip with two small, blunt teeth on each side. Column about 12 mm. long. Pollinia four.

In habit closely resembling *Chondrorrhyncha Endresii* Schltr. and *C. Reichenbachiana* Schltr. From the former it differs conspicuously in having the disc smooth in front of the callus. From *C. Reichenbachiana* it is separable in having a distinctly bilobed callus which does not extend laterally to the margins of the labellum.



COSTA RICA, Estrella de Cartago, C. H. Lankester & Alfredo Sancho 396, January 10, 1923. Radiating lines of labellum burnt-lake. Sepals and petals very pale baryta-yellow. Callus of the labellum empire-yellow. (Colors according to Ridgway.) (TYPE in Herb. Ames No. 23733.)

**Dichaea Lankesteri** Ames *sp. nov.* Herba epiphytica. Caules dense foliati. Folia decidua, linearia. Flores singuli e foliorum axillis orientes. Pedunculus tenuis, prope basim vagina pellucida vestitus, infra ovarium bibracteatus. Ovarium dense setulosum. Sepala lateralibus triangulari-lanceolata, longe acuminata, acuta, concaviuscula. Sepalum dorsale simile, apice deflexum. Petala anguste lanceolata, acuminata, acuta. Labellum e basi cuneata valde dilatatum, utrinque acutangulum, angulis plus minusve productis valde retrorsis, apice acuminatum, acutum. Discus ecallosus. Gynostemium crassiusculum, breviter pubescens.

Roots fibrous, spreading, whitish. Stems more or less caespitose, up to 14 cm. high, densely foliose, complanate, entirely concealed by the sheathing bases of the deciduous leaves, the lower portion defoliated at anthesis. Leaves up to 4.5 cm. long, about 3 mm. wide below the middle, spreading, decurved, distichous, linear, tapering gradually toward the acute tip, more or less membranaceous. Flowers shortly pedicellate, arising singly from the axils of the leaves. Peduncle slender, with an elongated sheath near its base and two more or less hyaline bracts near its summit, one of the bracts linear-triangular 5 mm. long, the other bract broadly oval concave and 5 mm. long. Ovary abbreviated, densely setulose. Lateral sepals about 8 mm. long, 3.5 mm. wide, triangular-lanceolate, acuminate, acute, the tip sharply bent downward. Dorsal sepal similar to the laterals. Petals 6.5 mm. long, narrowly lanceolate, acuminate, acute, strongly concave at the base. Labellum 6 mm. long, unguiculate, claw cuneate, dilated above the claw into a round-triangular lamina which is about 5 mm. wide across the base, with an acute angle on each side which is strongly retrorse, acuminate, acute at the apex, the tip thickened and deflexed. Disc

## CENTRAL AMERICAN ORCHIDS

ecallose, minutely glandular. Column stout, 2 mm. long, dilated upward.

In habit not unlike *Dichaea graminoides* (Sw.) Lindl., but with a very different labellum. In outline the labellum suggests *D. Willdenowiana* Kränzl., but is characterized by an elongated thickened tip.

COSTA RICA, Cascajal, *C. H. Lankester K353*. Flower white, very faintly greenish tinged, with a faint purple stain round the edge of the stigmatic surface. (TYPE in Herb. Kew.)

**Campylocentrum Lankesteri** Ames *sp. nov.* Radices elongatae, plus minusve complanatae, in sicco longitudinaliter sulcatae, albescentes. Caules multo abbreviati, subobsoleti, aphylli. Pedunculi quattuor, conferti, paene usque ad basim floriferi, erecti. Racemus gracilis, floribus distichis instructus. Bracteae flores subtendentes rigidae, patentés, concaviusculae, triangulares, acutae, ovarium pedicellatum excedentes. Flores minuti, albidi, oblique ascendentes. Sepala lateralía oblonga, obtusa, infra apicem apiculata, uninervia, membranacea. Sepalum dorsale ovatum, obtusum, infra apicem apiculatum. Petala elliptico-oblonga, obtusa, uninervia, diaphana. Labellum saccatum, in laminam trulliformem productum; lamina labelli explanata pentagona, abrupte acuta. Saccus scrotiformis. Columna incrassata.

Leafless epiphyte. Roots elongated, becoming whitish when dry, spreading, 4-5 cm. or more long, about 2 mm. thick, longitudinally sulcate. Stems subobsolete. Peduncle with the raceme up to 4 cm. high, the raceme itself up to 3.5 cm. long, slender. Bracts of the raceme about 1 mm. long, at right angles to the rachis, rigid, more or less concave, triangular, acute, exceeding the pedicellate ovary. Flowers distichous, about 2 mm. apart, hardly 3 mm. long, whitish. Lateral sepals connivent, about 2 mm. long, oblong, 1-nerved, obtuse, with a short apicule which arises from the thickened nerve just beneath the tip. Dorsal sepal about 2 mm. long, ovate, 1-nerved, obtuse, apiculate. Petals hardly 2 mm. long, oblong, obtuse. Labellum saccate at base, the sac

## CENTRAL AMERICAN ORCHIDS

scrotiform and 2 mm. long; lamina of the lip trulliform, 2 mm. long, pentagonal when spread out or quadrate with an abruptly acute tip. Column fleshy, very short.

In habit similar to *Campylocentrum Sullivanii* Fawc. & Rendle, from which it differs in the outline of the labellum which has the neuration less heavy.

COSTA RICA, Reventazu River, *C. H. Lankester* 71. 100 feet (?) altitude. (TYPE in Herb. Kew.)

# INDEX

## TO GENERA AND SPECIES

### CAMPYLOCENTRUM *Benth.*

- Lankesteri *Ames* . . . . 57  
Sullivanii *Fawe. & Rendle* 58

### CHONDRORRHYNCHA *Lindl.*

- Endresii *Schltr.* . . . . 55  
estrellensis *Ames* . . . . 54  
Reichenbachiana *Schltr.* . 55

### CLADOBIUM *Schltr.*

- ceracifolium *Schltr.* . . . . 5

### CRANICHIS *Sw.*

- Lankesteri *Ames* . . . . 5  
saccata *Ames* . . . . 6

### CRYPTOPHORANTHUS *Rodr.*

- Powellii *Ames* . . . . 8

### DICHAEA *Lindl.*

- graminoides (*Sw.*) *Lindl.* . 57  
Lankesteri *Ames* . . . . 56  
Willdenowiana *Kränzl.* . 57

### ENCYCLIA *Hook.*

- gravidia *Schltr.* . . . . 42  
Powellii *Schltr.* . . . . 35  
trachycarpa *Schltr.* . . . . 50

### EPIDENDRUM *L.*

- alanjense *Ames* . . . . 35  
amandum *Ames* . . . . 36  
Boissierianum *Schltr.* . . 41  
chloroleucum *Hook.* . . 37  
crescentilobum *Ames* . . 37  
cristobalense *Ames* . . . 38  
diurnum (*Jacq.*) *Reichb. f.* 47  
equitans *Lindl.* . . . . 39  
equitantifolium *Ames* . . 39  
estrellense *Ames* . . . . 39  
exile *Ames* . . . . 40  
floribundum *H. B. K.* . . 46  
gravidum *Lindl.* . . . . 1, 42  
imatophyllum *Lindl.* . . 43  
imbricatum *Lindl.* . . . 50

- Lankesteri *Ames* . . . . 45  
lauchcanum *Rolfe* . . . . 39  
lorifolium *Schltr.* . . . . 43  
palpigerum *Reichb. f.* . . 43  
pansamalae *Schltr.* . . . 38  
peraltense *Ames* . . . . 46  
phyllocharis *Reichb. f.* . . 40  
Porpax *Reichb. f.* . . . . 48  
Porpax *Reichb. f.* . . . . 51  
ramonense *Reichb. f.* . . 47  
ramosum *Jacq.* . . . . 49  
Sanchoii *Ames* . . . . 48  
santaelarensis *Ames* . . . 49  
singuliflorum *Schltr.* . . 41  
trachycarpum *Lindl.* . . 1, 50  
vestitum *Ames* . . . . 48, 51

### HABENARIA *Willd.*

- Lankesteri *Ames* . . . . 2  
repens *Nutt.* . . . . 3

### LANKESTERELLA *Ames* .

- costariensis *Ames* . . . . 4

### LEPANTHES *Sw.*

- cascajalensis *Ames* . . . . 27  
Chameleon *Ames* . . . . 28  
ceiliata *Schltr.* . . . . 28, 31  
estrellensis *Ames* . . . . 30  
fimbriata *Ames* . . . . 32  
horrida *Reichb. f.* . . . 29, 35  
inaequalis *Schltr.* . . . . 34  
micrantha *Ames* . . . . 31  
pristidis *Reichb. f.* . . . 32  
Sanchoii *Ames* . . . . 34  
tridens *Ames* . . . . 32

### MALAXIS *Sw.*

- brachyrrhyncha (*Reichb. f.*) *Ames* . . . . 8  
Javesiac (*Reichb. f.*) *Ames* 8  
lagotis (*Reichb. f.*) *Ktze.* . 8  
Lankesteri *Ames* . . . . 7



## INDEX—Continued

|                                           |        |
|-------------------------------------------|--------|
| <b>MASDEVALLIA Ruiz &amp; Pav.</b>        |        |
| Livingstoneana Roehl & Reichb. f. . . . . | 10, 11 |
| Livingstoneana Schltr. . . . .            | 9      |
| panamensis (Schltr.) Ames . . . . .       | 9      |
| <b>ONCIDIUM Sw.</b>                       |        |
| Lankesteri Ames . . . . .                 | 53     |
| suave Lindl. . . . .                      | 53     |
| Suttonii Batem. . . . .                   | 54     |
| <b>ORNITHIDIUM Salisb.</b>                |        |
| Bolleyi Schltr. . . . .                   | 53     |
| bracteatum Schltr. . . . .                | 53     |
| Lankesteri Ames . . . . .                 | 52     |
| <b>PLEUROTHALLIS R. Br.</b>               |        |
| acutipetala Schltr. . . . .               | 21     |
| amethystina Ames . . . . .                | 14     |
| arietina Ames . . . . .                   | 16, 23 |
| bifalcis Schltr. . . . .                  | 15     |
| cabellensis Reichb. f. . . . .            | 19     |
| cachensis Ames . . . . .                  | 17     |
| canae Ames . . . . .                      | 15     |
| cardiothallis Reichb. f. . . . .          | 21     |
| cedralensis Ames . . . . .                | 18     |
| ccrea Ames . . . . .                      | 19     |
| crescentilabia Ames . . . . .             | 20     |
| crocodiliceps Reichb. f. . . . .          | 17     |
| glomerata Ames . . . . .                  | 21     |
| Johannis Schltr. . . . .                  | 15     |

|                              |    |
|------------------------------|----|
| leucantha Schltr. . . . .    | 27 |
| Nelsonii Ames . . . . .      | 22 |
| octomerioides Lindl. . . . . | 20 |
| pergrata Ames . . . . .      | 24 |
| Pittieri Schltr. . . . .     | 26 |
| rufa Rolfe . . . . .         | 18 |
| ruscifolia R. Br. . . . .    | 22 |
| saccata Ames . . . . .       | 25 |
| Sanchoii Ames . . . . .      | 26 |
| ventricosa Lindl. . . . .    | 22 |
| Wercklei Schltr. . . . .     | 15 |
| Williamsii Ames . . . . .    | 25 |

|                             |       |
|-----------------------------|-------|
| <b>SCAPHOSEPALUM Pfitz.</b> |       |
| panamense Schltr. . . . .   | 9, 10 |

|                               |        |
|-------------------------------|--------|
| <b>STELIS Sw.</b>             |        |
| Bradei Schltr. . . . .        | 14     |
| cascajalensis Ames . . . . .  | 11     |
| inaequalis Ames . . . . .     | 12     |
| Lankesteri Ames . . . . .     | 12     |
| leucopogon Reichb. f. . . . . | 12     |
| microchila Schltr. . . . .    | 13, 14 |
| rhodochila Schltr. . . . .    | 14     |
| Sanchoii Ames . . . . .       | 13     |
| Tonduziana Schltr. . . . .    | 12     |

|                              |   |
|------------------------------|---|
| <b>STENORRHYNCHUS L. C.</b>  |   |
| Rich.                        |   |
| ceracifolius Schltr. . . . . | 5 |

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Pl 2



EPIDENDRUM *gravidum* Lindl.

Pl. 3

EPIDENDRUM

*trachycarpum*  
Lindl.



EPIDENDRUM

*Lankesteri* Ames